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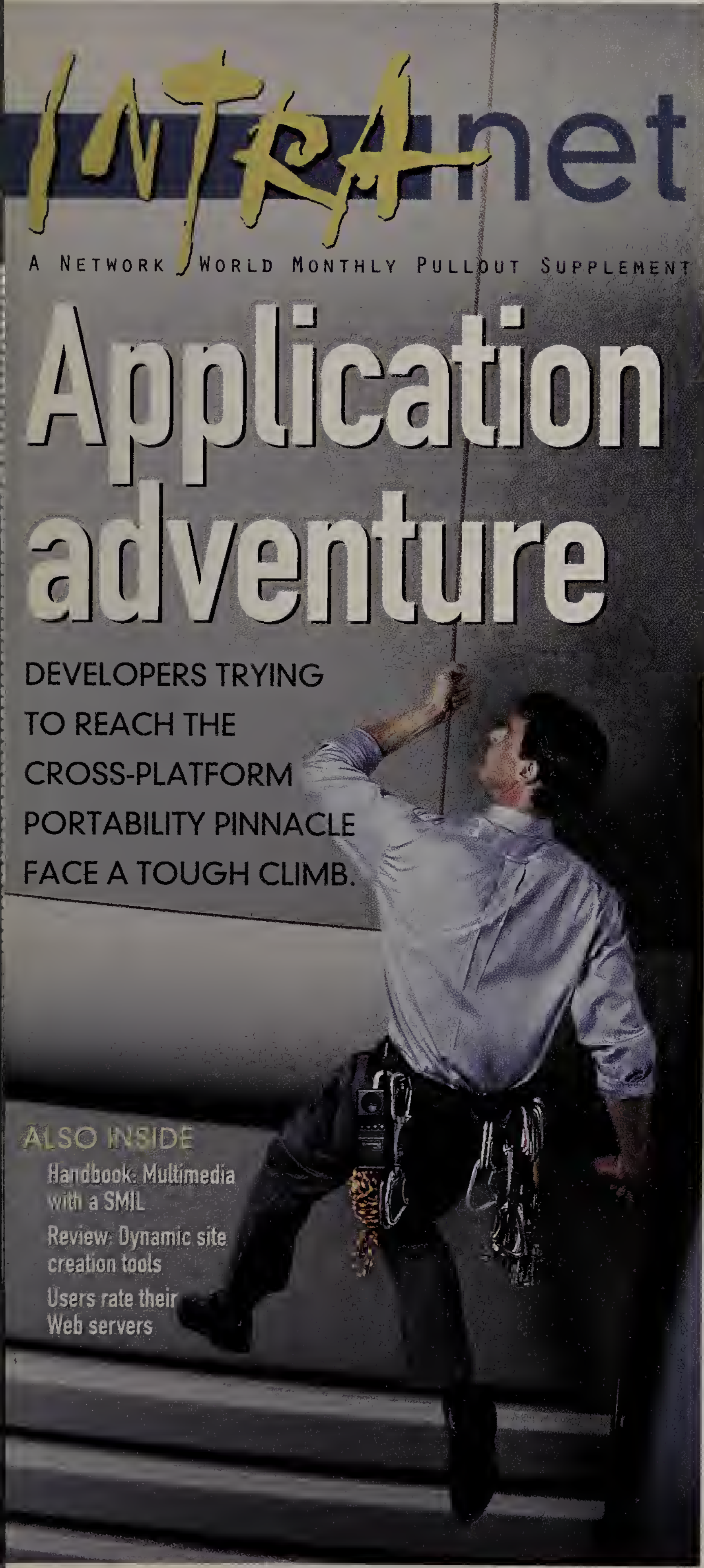
JUNE 29, 1998 VOLUME 15, NUMBER 26

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

WIN98 ARRIVES

Microsoft unveils its controversial new operating system. Stories, pages 14 and 15.



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AT&T buys TCI: Is a BT deal next?

By David Rohde
New York

Continuing to build network capacity through acquisition, AT&T last week announced it would purchase Tele-Communications, Inc. (TCI).

Additionally, rumors swirled that AT&T is seeking to acquire international capacity through a venture with British Telecommunications plc (BT).

On the home front, AT&T last week signed a deal to buy cable TV market leader TCI for $48 billion in AT&T stock. The move is

See **AT&T/TCI**, *page 16*

AT&T CEO C. Michael Armstrong (left) and TCI CEO John Malone shake on their $48 billion deal.

STEVE BORNS

An answer to Y2K crunch

By Paul McNamara
Pittsburgh

US WEST's Dallas Powell and his colleagues have 2,500 desktop products to check for Year 2000 problems.

What they don't have is time to rummage through hundreds of confusing vendor Web sites to hunt for Year 2000 compliance information.

Enter Infoliant Corp., a start-up here that has peddled its Year 2000 Network Advisor service to corporate household names such as Alcoa, Coca-Cola and Goldman Sachs. In essence, Infoliant has pulled publicly available Year 2000 compliance information for 15,000 products — from PCs and applications to servers, routers and switches — into a single Lotus Notes database. More than 200 vendors are represented, with several more being added every week.

Customers access the compliance reports over the Internet using Web browsers. The reports

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BUYER'S GUIDE

VALERIE SINCLAIR

VOICE-OVER-IP GATEWAYS

We put four voice-over-IP gateways to the test and found they could all place calls over the Internet with decent sound quality. But Oki Network Technologies' Internet Voice Gateway took home our Blue Ribbon for its easy installation and low price.

Check out the test results along with a chart listing more than two dozen voice-over-IP gateways and our trend story with tips for making your best buying call.

Review: Page 67.
Issues and Trends: Page 70.
Buyer's Guide Chart: Page 72.
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WIN98 ARRIVES

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Rumors and deals fill Cabletron's week

By Robin Schreier Hohman
Rochester, N.H.

It's been mighty busy at Cabletron Systems, Inc. of late.

Cabletron has been in high-level negotiations with Compaq Computer Corp. regarding the resale of $1 billion worth of Cabletron network gear.

At the same time, Cabletron last week wrapped up its long-expected purchase of switch maker NetVantage, Inc. and posted a modest profit for the first quarter.

And if all that isn't enough, in the wake of Nortel's blockbuster acquisition of Bay Networks, Inc. two weeks ago, speculation is growing that Cabletron will be the next big internetwork hardware company to get gulped down.

When Cabletron bought Digital's network business late last year, Digital agreed to buy $1 billion worth of Cabletron gear over the following 3 1/2 years. Now it's up to Compaq, which bought Digital earlier this year, to decide which products to resell, and whether it wants to modify any of the contract's terms.

The contract's details are currently being hashed out by Cabletron CEO Craig Benson and William Johnson, Compaq's vice president of network and access communications. The two met here two weeks ago at Cabletron's headquarters.

That meeting sparked talk that Compaq may be interested in buying Cabletron to fill out the Houston company's growing network product line. In fact, in the past few weeks, dozens of

See **Cabletron,** *page 89*

Get more online:

- **Recent Cabletron product announcements**
- **Overviews of latest big Internetwork mergers**
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See **Year 2000,** *page 89*

IP ringleader speaks

Q&A Level 3 Communications, Inc. last week announced the formation of an advisory group that is tackling the technical work involved in linking IP networks — such as the vast net being planned by Level 3 — and the public switched telephone network (PSTN). But Level 3 CEO James Crowe, former CEO of MFS Communications, Inc., said this technical effort is just the first step toward a more important goal: IP equal access.

In an interview with *Network World* Editor in Chief John Gallant, Crowe talks about the regulatory, legal and economic aspects of IP equal access and why enterprise network customers should care about it.

Can you explain the basic concept behind IP equal access?

Like long-distance and local equal access, it has a number of dimensions — technical, con-

See **Crowe,** *page 90*

CROWE-ING ABOUT IP

Level 3 CEO James Crowe says:

- Telephone and IP nets need to be linked at the signaling level.
- Traditional carriers must cooperate.
- The phone will become just another IP device.

BUYER'S GUIDE

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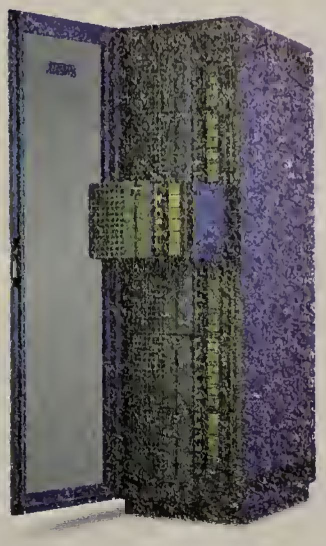

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Circle Reader Service **#33**

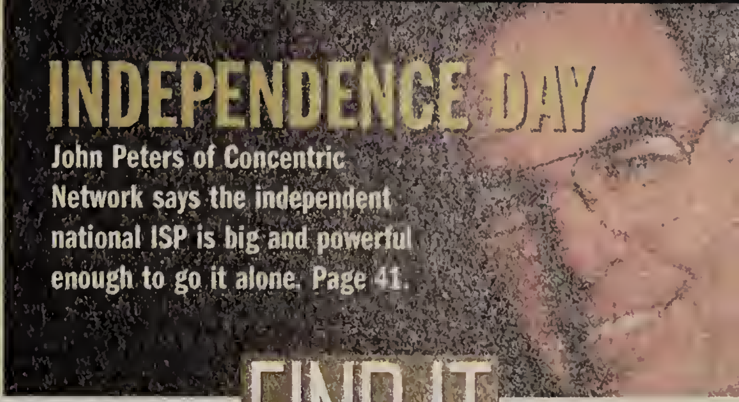
TRADING TEAMS

When Dion Brooks discovered his job was outsourced, he decided to become his own boss. Page 77.

PAUL BUCK

XEON INSIDE

Intel's Xeon processor will soon be powering a new breed of servers from Compaq (right) and others. Page 29.



INDEPENDENCE DAY

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ISSUES AND TRENDS: *Internet telephony is a cost-effective call, but interoperability is still lacking.* Page 70.

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JEFF SCHEID

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This Week

Only on Fusion

Thin clients. It's Microsoft vs. IBM in our latest Fusion Face-off online debate. Which has the better approach to thin clients: Microsoft with its Windows-based Terminals, or IBM with its Java approach? See what John Frederiksen, Microsoft's group product manager for Windows NT Server, Terminal Edition, and Howie Hunger, director of channels and marketing for IBM's Network Computer Division, have to say. Jump in with your comments and questions – they'll be in the forum all week to respond. **DocFinder: 7738**

The Water Cooler. It's our newest feature – a weekly column on happenings in networking by *Network World* editors. To kick things off, *Network World* Editor John Dix discusses the importance of keeping your management system up to date – even if you have to bring in an outsider to do it while you stamp out fires hither and yon. **DocFinder: 7743**

Cabletron. With all of its competitors merging or getting bought up, what's Cabletron's future? And how has it been doing of late? Join our new Cabletron discussion. **DocFinder: 7744**

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News briefs, June 29, 1998

Beware of Web servers speaking SSL

Last week, a cryptography researcher from Bell Labs discovered a security flaw in the Secure Sockets Layer (SSL) protocol that would allow a highly trained attacker to decode an Internet transaction encrypted with the technology. SSL is a session-layer protocol that encrypts data sent from a browser and decrypts it at the server.

The security flaw was found in technology developed by RSA Data Security, Inc., called the Public-Key Cryptography Standard #1, which is widely deployed in Web servers. Vendors, including C2Net Software, Inc., Consensus Development Corp., IBM, Lotus Development Corp., Microsoft Corp., Netscape Communications Corp., Open Market, Inc. and RSA, all issued advisories on their Web sites for dealing with the theoretical attack on SSL described by Bell Labs.

Microsoft, for example, said it has produced software updates for its Internet Information Server, Site Server and Exchange products. More information is available at www.rsa.com/rsalabs and www.bell-labs.com.

Gigabit Ethernet standard becomes a reality

After much delay, the Gigabit Ethernet standard is finally a reality. The IEEE Standards Association last week approved the specification, called 802.3z.

In practical terms, the announcement will mean little to users because many companies have already pledged upgrades based on the standard, according to Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. More information is available at http://standards.ieee.org/catalog/olis/index.html.

Big Brother was watching

The National Security Agency (NSA) last week made available secret encryption technologies that had formerly been kept hidden in hardware.

The Department of Defense said it may require that the technologies be used by businesses that do electronic commerce with the Defense Department. Known as the Skipjack algorithm and the Key Exchange Algorithm, the technologies provide the foundation for the Defense Message System's encryption card, called Fortezza, as well as the so-called Clipper Chip voice-encryption device. These devices let the government access encrypted data through duplicate keys held by the government or a trusted third party — an idea known as key-escrow.

NSA officials in 1994 said they had to keep Skipjack secret because it was so powerful. Officials said that if someone tried to use the encryption technology without the key-escrow feature, it would be a national security threat. Encryption experts who last week finally got the chance to look at the 80-bit Skipjack algorithm said they weren't that impressed. "It's not amazingly fast or amazingly small or amazingly clever. It is boring," said Bruce Schneier, president of Minneapolis-based security consultancy Counterpane Systems, Inc.

Symantec buys a ghost

Utility software developer Symantec Corp. last week said it plans to acquire Binary Research, Ltd., the maker of a disk-cloning product called Ghost, for $27.5 million. Symantec executives said Ghost will be added to Symantec's Norton line of PC utilities. This will let administrators set a PC's configuration, then duplicate it across multiple desktop machines. Microsoft Corp. earlier this month announced it is beta testing a disk-cloning product for Windows NT called Microsoft Systems Preparation Tool for NT 4.0 Workstation.

IBM easing Web access for small clients

Prototype technology crunches graphics to make them fit on tiny screens.

By Marc Songini
Yorktown Heights, N.Y.

Big Blue may have found the answer for end users who are paying the performance price for accessing the Web via small client devices over low-speed lines.

The IBM Research Division last week revealed that it's working on a technology designed to shrink Web data — including graphics — down to the optimal size for users of laptops, palmtops and even Web-enabled phones.

Not only would this technology enable the growing legion of small client users to gain faster Web access, it also would help reduce corporate communications costs.

This could be a boon for net administrators, who could use the technology to set policies regarding what sorts of files could go to users of PalmPilots or other such devices.

IBM emphasized, however, that the company's year-old Content Adaptation Framework (CAF) technology is still in the prototype stage. IBM has not decided if or when CAF will turn up in commercial products.

But if the technology does become generally available, IBM researchers said it will likely sit on Web servers, clients and even proxy servers.

The proliferation of tiny Web-capable devices whose chip, memory, cache and screen sizes are only able to handle small files, demands that Web servers treat these devices accordingly, said Richard LaMaire, manager of mobile networking for the IBM Research Division. LaMaire and another IBM research partner, Chung-Sheng Li, oversaw the CAF project at the Watson Research Center.

The technology would enable an end user, for example, to choose to look at just a few frames from a video clip rather than the whole clip, LaMaire said. "This will reduce the cost of Web access," he said.

Many mobile devices access corporate Web servers via low-bandwidth connections — an expensive proposition, LaMaire said.

It could cost a company $5 just for an employee to download a 100K-byte image via a wireless Cellular Digital Packet Data device, he added.

Speedy delivery

CAF could help speed delivery of such an image and, as a result, make for a less expensive call. End users could decide how much picture quality they are willing to sacrifice for the sake of speed.

Mobile workers could define parameters via a Java applet or through an HTML-based graphical user interface.

Based on these governing parameters, a map could then be "transcoded" — in IBM lingo — so that it is still readable but not an exact reproduction of the original.

For instance, if a user were moving a JPEG file to a small client device, CAF would decode the JPEG and reassemble it based on preset transcoding policies.

The governing policies might reduce the number of pixels or change all the colors into shades of gray.

However, the technology is capable of altering resolution, color-depth and size without making the image unrecognizable, LaMaire said.

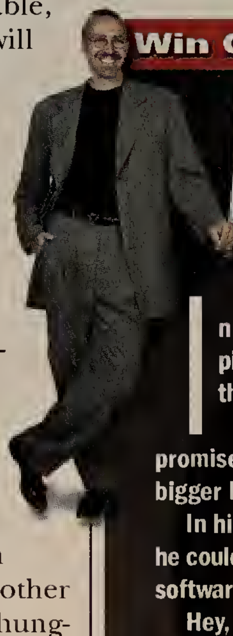
About the best customers can do today is use a browser that allows them to shut off graphics completely when accessing a Web site, he said.

CAF is not limited to just pictures, LaMaire pointed out. It could also be used to summarize text and condense something such as a news story to just its headline.

Web administrators who don't want to go through the hassle of adjusting a site to work with every conceivable end-user device might be good candidates to use IBM's technology if it becomes commercially available, said Tim Sloane, an analyst with Aberdeen Group, Inc. in Boston.

"It's a future problem more than a [current] problem," he said.

But Sloane said he is encouraged that IBM is working on CAF now, given that Web access by small client devices will "blossom as a problem as these intelligent devices blossom." ■



Win Gibbs for a day!

And the winner is...

In the hotly contested battle over which organization would win a pizza lunch with *Network World*'s venerable columnist, Mark Gibbs, the honors go to Union Switch & Signal, Inc. of Pittsburgh.

To refresh your memory, we held out Gibbs as a carrot and promised the reader who sent in the best essay about "Why we need a bigger IT budget" would get a personal visit from Mr. Gibbs.

In his winning entry, Bob Patterson, manager of network services, said he could use the green to fund an international WAN, network management software and an upgrade to switched desktop links.

Hey, there were funnier ones, but this guy needs some help. Now he'll have the opportunity to kvetch about it with Gibbs.

Runner-up Michael Melliar-Smith from the University of California at Santa Barbara said he didn't need a bigger IT budget: "What we need is better software so that we can have a smaller IT budget. The software side of the IT budget still buys junk, and much of the human element of the IT budget is wasted on coping with that junk."

Couldn't agree with you more Michael, and I'm afraid that's all you get as runner-up.

- Log on to Network World Fusion to read entries from Patterson, Melliar-Smith and others.
- Stay tuned for a report on Gibbs' visit to Union Switch & Signal.

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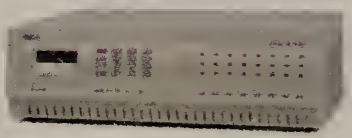

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*Circle Reader Service #***23**

Cisco rides alone into the voice world

CEO Chambers rules out megamergers, but alliances and partnerships not out of the question.

By Tim Greene
San Jose, Calif.

Parting from its recent pattern of buying, merging or allying with other companies to bring products to market, Cisco Systems, Inc. has walked away from partnerships with the two biggest voice technology vendors in the U.S.

After being spurned by voice switch giants Nortel and Lucent Technologies, Inc., Cisco decided it could do just fine going it alone, Cisco CEO John Chambers said last week in a published interview.

Cisco said that it wanted to share either Nortel's or Lucent's clout with carriers, but Cisco also demanded that Nortel and Lucent refrain from developing high-speed gear similar to Cisco's Catalyst 8500 switch-router.

Both companies said no, and everybody walked away from the bargaining table.

Chambers said he has ruled out merging with a major voice vendor as a way to shore up Cisco's perceived weak voice expertise. That leaves Cisco on its own to develop voice capabilities for its gear so corporations and carriers can migrate from separate voice and data networks toward single networks that carry both.

Developing that gear on its own could be a severe challenge. "While Cisco is starting to dabble in voice-over-packet networks, [it has] absolutely no credibility in enterprise voice like Nortel and Lucent do with their PBXs," said John Coons, an analyst with Dataquest here. "Would Cisco have an enterprise transition path from a Nortel PBX to a Cisco-based environment? No."

Similarly, Cisco lacks the trust of established network service providers. "I don't think Cisco is taken seriously by the traditional carriers as knowing how to build and support carrier-hardened equipment. Just having Lucent or Nortel behind you when you go in to one of these [carriers] goes a long way. Those carriers are leery of most of the data networking companies," Coons said.

That caution has not hampered Cisco from forging a strategic alliance with US WEST, Inc., or from being named as a key provider for Sprint Corp.'s voice/data network of the future, the Integrated On-Demand Network (*NW*, June 8, page 1). Nortel, whose switches anchor Sprint's voice network, was not mentioned.

EDWARD CALDWELL

"Lucent is trying to compete in a New World environment when they're an Old World company."

John Chambers,
CEO, Cisco

Since partnership talks between Cisco and Nortel broke down, Nortel has announced plans to buy Cisco's arch rival Bay Networks, Inc.

Relations with Lucent have not gone any better. Lucent is suing Cisco over alleged patent infringements. Chambers described that suit as evidence that Lucent is at a loss for how to compete against Cisco in the voice/data market. "Lucent is trying to compete in a New World environment when they're an Old World company," Chambers said.

Despite Chambers' bluster, other Cisco officials last week said the breaks between Cisco and Lucent and Nortel are not necessarily permanent. They may wind up in alliances later, said Larry Lang, Cisco's vice president of service provider marketing. ■

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@Work boosts high-speed Internet access

By Denise Pappalardo
Redwood City, Calif.

Aiming to boost users' high-speed Internet access options, service provider @Work this week will announce new digital subscriber line (DSL) and cable modem services.

@Work, which is ISP @Home Corp.'s business service division, is also expected to announce this week that it's making an investment in NorthPoint Communications, Inc., a competitive local exchange carrier (CLEC). The move could speed the rollout of DSL Internet access services for @Work customers.

Based on its new relationship, @Work plans to offer customers DSL Internet access services by the fourth quarter of this year, said Don Hutchison, senior vice president and general manager of @Work. The service will let users connect to the Internet at rates of 160K bit/sec to 1M bit/sec.

While @Work's stake in NorthPoint makes it a minority investor, the investment lets @Work influence where the CLEC rolls out its DSL services.

Through a deal with Cox Communications, Inc., one of @Home's parent companies, @Work will support a new cable modem Internet access service, Hutchison said. @Work's cable modem Internet access service will support 128K bit/sec up to 1.544M bit/sec and will cost $245 to $900 per month.

The service is running over Cox's hybrid fiber coax (HFC) cable network. The service is currently available in Orange County and San Diego County, Calif., with service expected in Hampton Roads, Va., New Orleans, Oklahoma City, Omaha, Neb., Phoenix and in New England in the next few months, he said.

While @Work is introducing new DSL and cable modem Internet access services, at least one of its current customers has not seen the need for these alternative high-speed services.

Cable modem service is best-suited for remote users, said Dwight Gibbs, chief technical fool at The Motley Fool, Inc., a Web-centric financial advisory company based in Alexandria, Va. The Motley Fool has a dedicated T-1 line from @Work that has been very reliable, Gibbs said. In fact, some of The Motley Fool's technical staff dials into the corporate network using another provider's cable modem service, Gibbs said. The technical staff likes the service, but The Motley Fool is not going to put its business applications on an HFC because the company believes its dedicated services are more reliable right now, he said.

@Work is also expected to announce its Dual Multihoming service, which will offer users network connectivity backup. Dual Multihoming pricing is not yet available.

@Work: (415) 569-5000

Senior Editor Tim Greene contributed to this story.

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What's the special meaning behind the word "Xeon" – the name of Intel's new server and workstation processor?

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Users swear by their digital certificates

Single sign-on emerging as hot application of X.509 certificates, e-mail securities also popular.

By Ellen Messmer
Chicago

X.509 digital certificates, a type of software ID typically used to digitally sign or encrypt files and e-mail, are now being used for a somewhat unexpected purpose: single sign-on for access to host computer and Web-based applications.

SWIFT's De Clercq *banks on X.509.*

The newfound popularity of certificate-based single sign-on was evident at the Entrust Communications, Inc. SecureSummit '98 conference here. The summit was attended by about 500 corporate and government organizations from around the world. Almost a dozen organizations presented details on how a user's digital certificate can remedy the problem of maintaining multiple logons and passwords for access to internal systems.

"I want to log in to my laptop, log on securely, do e-mail, browse the Internet and get remote access to all my authorized applications using my X.509 certificate," said Ainsley Rattray, vice president of security and Internet architecture at J.P. Morgan & Co. J.P. Morgan has been working with the Entrust PKI Version 4.0 tool kit to create single sign-ons for its employees and trading partners.

Rattray, who likes to call this certificate-based single sign-on the "ultranet," said J.P. Morgan's clients "are requesting more access to the corporate network to view client statements online, make trades on the Web and get research from our corporate network." Rattray said users should only have to log on once to receive all authorized access, and digital certificates can be used to provide that access far more securely than simple passwords. Access is more secure because digital certificates, issued by a certificate authority such as J.P. Morgan, link the user's identity with unique encryption keys that are far less likely to be compromised than passwords.

An Entrust survey shows that digital certificates are popular not only for their single sign-on feature but also for e-mail security; 20% of users said they would use the certificates for e-mail security, and another 20%, said they would use them for single sign-on. Among the other survey results, 17% of respondents said they would use the certificates for financial applications, 16% for electronic forms, 19% for remote access, and 9% for "other."

The Entrust PKI tool kit is going to be used to build the next-generation secure network for international banking transactions, according to Luc De Clercq, senior manager for global information security at the Society for the Worldwide Interbank Financial Telecommunication (SWIFT) private network.

The SWIFT network serves more than 6,000 banks in about 175 countries. While retooling the network is going to take some time, offering single sign-on for specialized banking services is going to be part of SWIFT's future.

Some banks are bullish on single sign-on with certificates. Citibank Vice President Jay Gould said the bank is using Entrust certificates to work as the authentication mechanism for Gradient Technologies, Inc.'s NetCrusader single sign-on product, which can place fine-grained access controls on files stored in Web servers. With NetCrusader and Entrust integration, HTML data can be encrypted for the user as well.

In order to access information about its 230 hospitals and 140 clinics nationwide, Nashville-based Columbia/HCA Healthcare has started to implement Entrust PKI for single sign-on as well as for local file encryption, e-mail, electronic forms and remote access.

"Simplified sign-on is a big issue for us," said Keith Walker, senior security consultant at Columbia/HCA. "We don't call it single sign-on because we don't think it'll ever get there. But we definitely think it can be simplified."

There's a lot of skepticism about single sign-on in the user community. According to Federal Express Corp. data-protection advisor Kirtikumar Satam, single sign-on requires the creation of a secure identity for an individual that can be passed from one application to another. Single sign-on also requires working across multiple operating systems and networks without intervention from the user, unless specified.

Satam said he doubted there are off-the-shelf products that comprehensively perform these functions yet.

Despite the skepticism, FedEx is testing how a browser-based logon with Entrust certificates could be used to control access to Web applications. ■

J.P. Morgan's *Rattray wants secure remote access.*

PHOTOS: RALF-FINN HESTOFT

Come on, give us your Web site

By Denise Pappalardo

Enhanced service-level guarantees and improved Web hosting services may be just the ticket for users thinking about outsourcing their corporate Web sites.

Exodus Communications, Inc. and NaviSite Internet Services this week are introducing new service-level agreements (SLA) that offer users guaranteed uptime. And PSINet, Inc. last week announced new dedicated Web hosting services.

"Fortune 1000 companies are thinking hard about Web hosting," said David Cooperstein, senior analyst at Cambridge, Mass.-based Forrester Research, Inc. But service providers such as Exodus and NaviSite haven't proven themselves to corporate America yet, which is why they are coming out with SLAs, he said.

Exodus' new SLA guarantees 99.97% network availability, a minimum packet loss of 1% and minimum round-trip latency of 120 msec. Exodus calls its SLA the Exodus Data Network Guarantee.

NaviSite, a CMG Information Services, Inc. company, is guaranteeing 99.99% network availability, 99.9% Web server availability and 99.9% database server availability.

NaviSite is also announcing new data mirroring, load balancing and failover, database server clustering and disk storage support.

NaviSite's enhancements are also designed to offer users the stability and network reliability they are looking for when outsourcing the hosting of their Web sites. While pricing varies, the general range for the enhancements is $100 to $400 per month on top of NaviSite's dedicated or colocation Web hosting fees.

THE DOLLARS AND CENTS OF WEB HOSTING

Growing demand for better performance and more useful content will drive more corporations to outsource their Web hosting resources. This trend will contribute to the growing Web hosting services market.

Web hosting services market revenue:

Types of sites hosted	Static, non-interactive sites	Complex, rich content sites
1998	$300 million	$600 million
1999	$400 million	$1.4 billion
2000	$600 million	$2.8 billion
2001	$800 million	$5 billion
2002	$1 billion	$8 billion

SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.

On the new service front, PSINet announced it would team with Hewlett-Packard Co. to support new PSIWeb Dedicated Hosting services. PSINet is using HP's Unix and its OpenView network management system to monitor PSINet's Web server farm.

PSIWeb Dedicated Hosting service starts at $1,500 per month.

Why all of these new Web hosting initiatives? Overworked and understaffed IT personnel, observers said. "IT staffs are getting too overwhelmed with Year 2000 issues, managing applications like SAP and managing desktop issues," Cooperstein said.

In less than five years, the Web hosting service market is expected to bring in $8 billion in revenue for services providers (see graphic).

The role of the Web site is changing, said Tim Sloane, a director at Aberdeen Group, Inc., a Boston consulting firm. "Web sites are going from dishing out pages to running applications to integrating back-end systems," he said. This is driving Web hosting growth, but some users are still choosing to keep critical database servers in house because they are not entirely comfortable handing over critical servers or databases, he said.

This is the route that Mirablis, Ltd. of Rockville, Md., has taken with its Web site. PSINet has been hosting the Mirablis ICQ Internet messaging and chat group freeware Web site for nearly two years. PSINet is also hosting ICQ's Web site.

But when users establish a chat group, for example, they are transferred back to a Mirablis internally monitored and managed server, not a PSINet server.

But Avner Parnes, Mirablis' director of international business development, said his company would never have been able to keep up with the growth of its Web site if it didn't outsource the site to PSINet.

ICQ was first hosted on a shared server, and after a few upgrades, the site is now hosted on one of PSINet's new dedicated HP servers. The ICQ Web site now gets one million hits per day. ■

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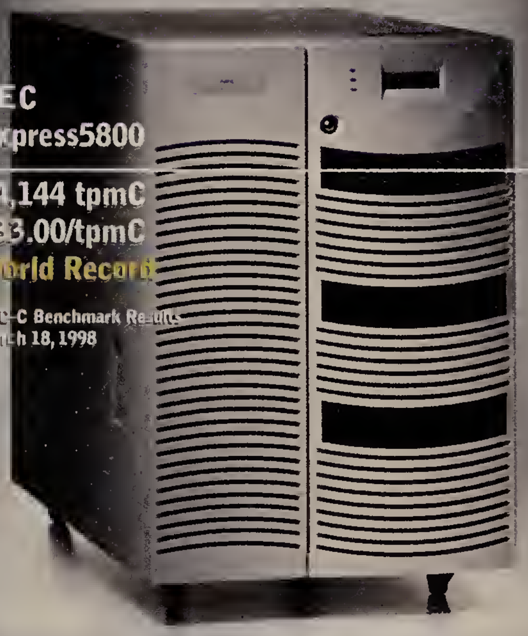

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Many ignore Microsoft's NT advice

Those corporate users reluctant to make the jump to NT eye Windows 98.

By John Cox and Andy Eddy

Microsoft Corp. says its operating system strategy is simple: NT is for corporate desktops and Windows 98 is for consumers. But the shipment last week of Windows 98 has made MIS desktop decisions more, rather than less, complicated.

Do you choose an aging but stable version of NT — NT 4.0, which requires more computing horsepower but has less-than-perfect compatibility with Windows applications? Or do you snag a spiffy new sub-$1,000 PC already loaded with Windows 98 and immediately enjoy the benefits of browser integration?

For now, it seems most corporations will ignore Microsoft's advice and choose Windows 98.

Market research figures show Windows 98 will have a good run, even among business users (see graphic). Adoption of Windows NT Workstation, which Microsoft marketers insist is the future of the corporate PC, is picking up but perhaps not as fast as Microsoft would like.

Most business use of Windows 98 and NT 4.0 will be through purchases of new PCs, not upgrades, according to International Data Corp. (IDC), a Framingham, Mass., technology market research company. Part of that decision is fueled by the surging hunger for PCs priced at less than $1,000, most of which will run Windows 98.

On the other side, in a recent IDC survey of 300 IS purchasing agents, 32% said they plan to buy NT-based PCs in the next year. Those numbers must be causing jitters in Redmond because they suggest some number of corporate MIS groups are balking, or at least delaying, plans to embrace NT on the desktop. For some, moving from Windows 95 to 98 may be an interim step to buy time before the more wrenching shift to NT.

The New Haven (Conn.) Public Library, like many business sites, has a mix of NT and Windows 95 desktop computers for about 40 users, including PCs made available to library patrons. There won't be any abrupt change to that strategy.

"We want to see what advantages 98 might give us," said Jon Glendon, a library supervisor. "The integration of the Web browser and the operating system [new and controversial in Windows 98] might be an advantage to our users, especially to our customers."

Glendon is not alone with his wait-and-see attitude. "We're just finishing our Windows 95 rollout now," said Kevin Konski, a systems administrator with Covance Clinical and Periapproval Services, Inc. in Princeton, N.J., which manages drug testing and research for pharmaceutical companies. "If there's a compelling business reason, we'll switch to Windows 98. But we won't adopt it just because it's there." Konski has been aware for years that NT is Microsoft's primary future operating system. "But the issue for us is the applications and software support," he said. "We have applications that are available on Win95 but not on NT."

Microsoft managers continue to hammer on the benefits of NT. "If [corporate customers are] not using NT 4.0 Workstation now, they're not getting the benefits that NT brings: better performance, better security, better manageability," said Craig Beilinson, Microsoft product manager for NT 4.0 Workstation.

That is a convincing argument for some companies, among them Andersen Corp., a Bayport, Minn., manufacturer of windows and doors. All new desktop PCs bought for Andersen run NT Workstation 4.0. Two big reasons for going with NT were its stability and its capacity to block users from adding software or making changes to the installed software, said Robert Bensen, senior technical architect.

At Andersen, NT is preinstalled on a standard PC model, currently a Hewlett-Packard Co. Kayak XA, with a Pentium II 266-MHz chip, 64M bytes of memory and a 4.3G-byte hard disk. "It gives us a cookie-cutter approach to all our desktops: everybody gets the same thing," Bensen said. "We looked real closely at the cost-of-ownership studies. We found the initial cost for hardware is only about 8% of the total unit cost over several years. So we wanted to attack the part that gave us the biggest payback." That meant reducing desktop support and maintenance requirements.

But if other corporate users aren't getting NT's benefits, they're also not getting the headaches involved in making the shift. Many corporate users have only just finished, or are still going through, the painful shift from Windows 3.1 to 95. They're very reluctant to go through a similar process for NT, which has dramatically higher needs for processor performance, memory and disk space. At least some customers say they'll stay with Windows 95 or perhaps adopt 98, rather than make the much bigger jump to NT.

Part of the reason is the expected pain of shifting applications to NT, a move even Microsoft says will be difficult. "It's not as smooth a process as users would like," said Shannon Perdue, U.S. product manager for Windows marketing and desktop solutions. The main problem, she said, is the long process of making changes to the operating system's Registry, which is akin to a database for configuring software on an individual computer. ■

WINDOWS 98 OUTPACES NT

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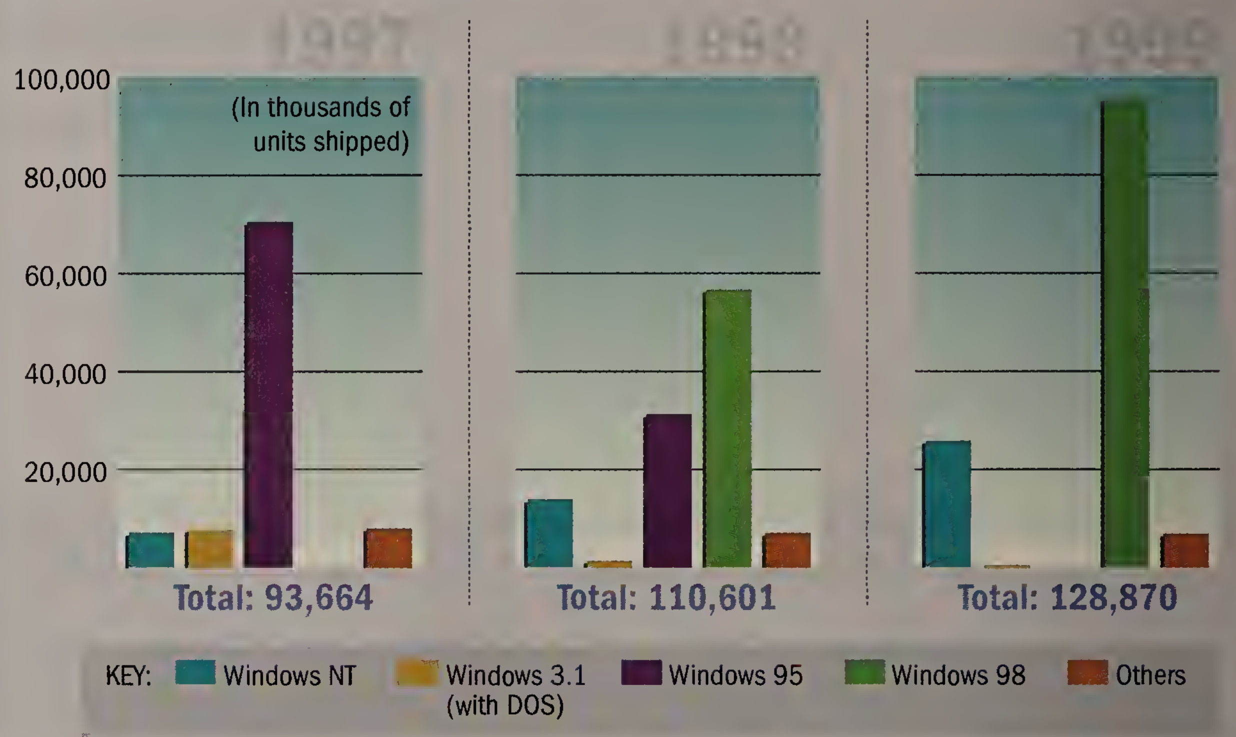

SOURCE: DATAQUEST, SAN JOSE, CALIF.

Windows 95 bundling restriction lifted

One day before the general release of Windows 98, Microsoft Corp. learned that Windows 95 could be bundled with its Internet Explorer browser after all.

A federal appeals court in Washington, D.C. last week struck down the ban a judge imposed last December against prebundling Windows 95 and Internet Explorer.

The ruling does not stop the broad antitrust case filed in May by the U.S. Department of Justice against a variety of Microsoft marketing activities. But analysts agreed it does serve as a warning to Federal Judge Thomas Penfield Jackson, who will hear the Justice Department's case on Sept. 8, against putting too much weight on one of the antitrust suit's central tenets: the allegedly illegal tying of PC operating systems with Web browsers.

The three-judge panel unanimously ruled that Microsoft had made a "plausible" case that putting operating systems and browsers in the same piece of software offered user benefits beyond a stand-alone browser such as Netscape Communications Corp.'s Navigator.

The finding said the injunction against Windows 95 and Internet Explorer bundling was an inappropriate level of judicial micromanagement, the court said. "Antitrust scholars have long recognized the undesirability of having courts oversee product design, and any dampening of technological innovation would be at cross-purposes with antitrust law," the court ruled.

Microsoft officials crowed that the same logic should apply to Windows 98. "The court today has helped focus the legal issues squarely where they belong, by concentrating on whether a product innovation brings new benefits to consumers," William Neukom, Microsoft senior vice president for law and corporate affairs, said in a prepared statement. "We have long been confident that our Internet improvements to both Windows 95 and Windows 98 meet this test."

Still, the Justice Department is likely to focus on other issues in the broad case, such as exclusionary contracts with PC manufacturers.

— David Rohde

Microsoft holds Windows 98 fete

By Andy Eddy
San Francisco

Microsoft Corp. held a launch party for Windows 98 along the breezy shoreline of San Francisco Bay last Thursday, and the only crashing that took place was the sound coming from waves on the nearby pier.

At Route 98, as the Windows 98 inauguration was billed, Microsoft officials equated the operating system to a road that can take users anywhere. Luckily for Bill Gates and his clan, the presentation to a gathering of hundreds of invited reporters and analysts went without a hitch, a contrast to the Windows 98 crash at the Comdex trade show held in April in Chicago.

Windows 98 *is now selling in over 150 countries.*

At the Route 98 event, Microsoft Vice President of Marketing Brad Chase poked fun at the previous episode, then successfully plugged in a Universal Serial Bus scanner to quickly capture a picture of his infant son from a photograph.

Microsoft's function also featured a mix of emotion not usually found at a computer-industry demonstration, including a touching story about a Chicago-area policeman who was paralyzed in the line of duty. He was shown using Windows 98's accessibility features to reduce the restrictions he'd face using a standard computer.

Occasionally, the presentation came off as a little hokey, inspiring subdued snickers from the crowd. One spotlight user was country music star Reba McEntire, whose anecdotes seemed forced. Video clips shot at her office appeared far from spontaneous. Later, a group of teenagers and senior citizens, in a display of how the new operating system inspired togetherness across the generations, offered heartfelt opinions on what Windows 98 meant to them.

Oddly enough, Windows 98's benefits were emphasized as relief from Windows 95's stability and Internet connectivity shortcomings. Attendees were almost left wondering if Microsoft was saying that its crash-prone, disconnected Windows 95 was a bad product.

Bill lectures

Gates closed the event with a lengthy talk comparing today's PC industry to the early, "enthusiast" days of the automobile. He also predicted that by 2001, 60% of the homes in the U.S. would have a computer, and 85% of the PCs would be connected to the Internet.

Following Gates' speech, partners such as Eastman Kodak Co., Storm Technology, Inc. and WavePhore, Inc. showed off the benefits of Windows 98 on their wares.

Microsoft broadcast the event to approximately 100,000 people at places such as computer retail outlets and United Artists movie theaters. Windows 98 is selling in over 150 countries and in 30 languages. Microsoft claimed it received 120,000 preorders for Windows 98 before the official launch. ■

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Wireless giants seek common code

By Denise Pappalardo
London

Interoperability is key when it comes to wireless communications.

That's why mobile telecommunications equipment giants L.M. Ericsson Telephone Co., Nokia Corp. and Motorola, Inc. last week teamed with Psion PLC in a joint venture, called Symbian, aimed at creating a common operating system for wireless information appliances.

Symbian will focus on developing Psion's Epoc 32 operating system and licensing it to manufacturers of wireless information devices, such as smart phones and handheld communicators.

Symbian will also be a direct competitor with Microsoft Corp.'s Windows CE operating system, currently deployed in many handheld wireless devices. But the equipment manufacturers will be free to use other operating systems, such as Windows CE, in their range of handheld products.

Wireless manufacturers are coming together to work on a common operating system for smart phones because if the lack of interoperability or limited coverage are issues business users will not use these devices, said Bob Egan, research director at Gartner Group, Inc., a Stamford, Conn.-based consulting firm.

However, for smart phones, which differ from handheld computers in that they have built-in wireless connectivity, the companies will likely use only the Epoc 32 software so their products will be able to easily communicate with each other, a Psion spokeswoman said.

Ericsson, in conjunction with Hewlett-Packard Co., already has a Windows CE device on the market, and plans to continue developing Windows CE products, said Jan Ahrenbring, vice president of mobile communications at Ericsson.

But Ericsson plans to use Epoc in all of its smart phone products and reserve Windows CE for its PDA-type products that don't have built-in mobile connectivity, he said.

Kristi Essick at IDG News Service's London Bureau contributed to this story.

PROFILE: SYMBIAN GROUP

Members: L.M. Ericsson Telephone Co., Nokia Corp., Motorola Inc. and Psion PLC

Goal: To develop a common operating system for wireless information devices such as handheld computers.

Fact: Psion estimates the mobile wireless device market will be worth some $900 million by 2002.

AT&T/TCI

Continued from page 1

and Internet access services over cable lines — assuming it can convert those lines to handle two-way transmission of information.

On the international scene, numerous sources last week said AT&T is negotiating a possible deal with BT. AT&T is reportedly pushing BT to dedicate its international network assets to a new global-services joint venture.

A European source close to AT&T said that within 30 days the company will seek a deal to link its international assets to an AT&T/BT joint venture. Those international assets include AT&T's European network, AT&T-Unisource Communications Services, as well as the AT&T global confederation, WorldPartners Co.

"There are definitely such discussions going on," said Berge Ayvazian, senior vice president of The Yankee Group consulting firm in Boston. Also involved in the talks: Japan's predominant international carrier, Kokusai Denshin Denwa, according to another source.

Behind all the AT&T moves is a strategy of tight partnerships and strategic purchases with vendors of hardware, software and network services that began shortly after AT&T Chairman and CEO C. Michael Armstrong took office last November (*NW*, Jan. 19, page 1).

Once averse to outside interference or adopting outsiders' technologies, AT&T has in the last three months signed a bevy of partnership, licensing and acquisition agreements.

Most recently, AT&T concluded a deal with Hewlett-Packard Co. to provide HP's Smart Contact suite of computer-telephony software to AT&T's call center customers, adding to a spate of recent network, bandwidth and performance management deals (see graphic).

But while vendors seem to love partnerships, users are not convinced partnerships solve everything. For example, HP Smart Contact customer George Steinhoff, large-group systems manager for Blue Cross of California, said joining HP's computer-telephony software with AT&T toll-free services wouldn't be enough to move him off his MCI Communications Corp. network-services contract.

"I would be looking for more of a discounting of the [price of my] phone calls as opposed to a bundling of all the services," Steinhoff said.

But AT&T officials say the company's strategy needs time to pay off, and the new AT&T partnerships are following a definite pattern. For example, the TCI acquisition propels AT&T into the local residential market, just as its January acquisition of competitive local exchange carrier Teleport Communications Group, Inc. put AT&T into the local business market.

The desire to control network assets rather than promote loose alliances, which are subject to finger pointing and excuse making, is an element common to both acquisitions, and the possible international network restructuring with BT. The residential market — once seen as the best market for resale of regional Bell operating companies' local lines — was the last to fall under this philosophy.

"I think for AT&T they had no choice," said Steve Sazegari, president of Tele.Mac, a Foster City, Calif., telecommunications consulting firm. "[AT&T] had tried every other avenue to solve the local loop problem, and they did not see any end of the tunnel trying to deal with the RBOCs."

The TCI acquisition carries a substantial risk because TCI is only about halfway through a project begun 18 months ago to convert its cable plant to two-way transmission for voice and Internet sessions.

But once the project is complete, residential customers will be able to self-provision permanent or temporary telephone lines, bump up or down the speed of their Internet access, or order products electronically over their TV sets, said John Malone, TCI's chairman and CEO. And even though the offers will be directed at the home market, "They will be so cheap that your employer will probably supply it to you," Malone added.

AT&T's strategy is in sharp contrast to those of MCI and Sprint Corp. in the effort to provide voice and data services over the same end-to-end network.

So far, MCI's efforts have been aimed exclusively at business users who have high-speed Synchronous Optical Network access directly from MCI or its merger partner, WorldCom, Inc.

Sprint, with its recently announced Integrated On-Demand Network, is aiming at both business and residential customers but will rely on fiber or dial-up digital subscriber lines leased from RBOCs rather than its own last-mile facilities.

Armstrong said he is insisting on owning the end-to-end facilities. "We have to control the access, not just a dialogue to get that access," Armstrong said in making the TCI acquisition announcement.

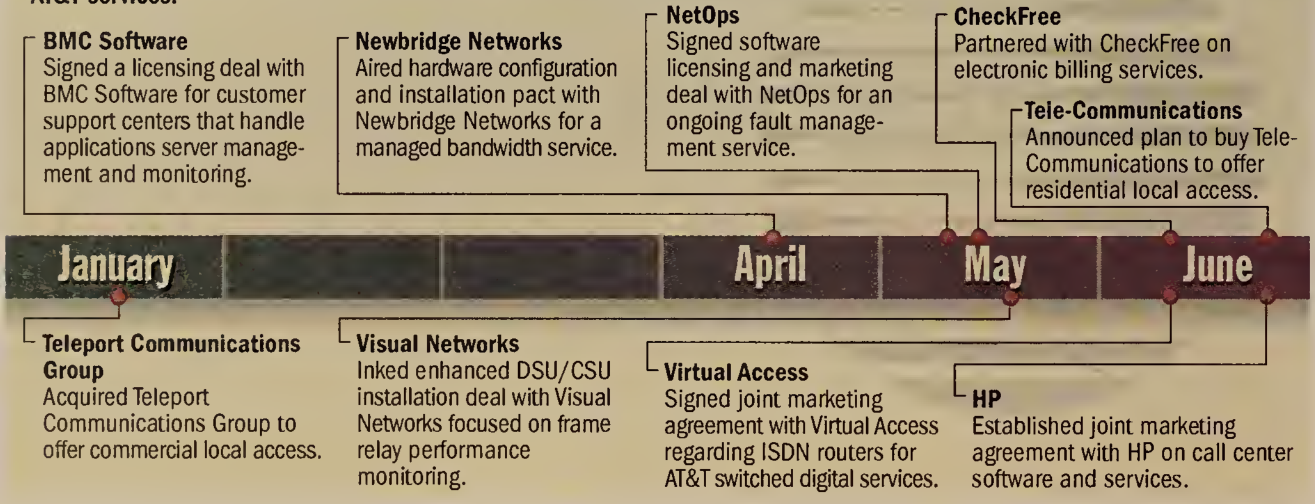
Oddly, the RBOCs may come out of the AT&T/TCI deal smiling. Several released statements saying that if the deal goes through, the Federal Communications Commission would have no reason left to deny the RBOCs entry into the long-distance market.

And the cable aspect of the deal may leave the RBOCs relieved that AT&T does not have ready-made telephony lines to compete with them locally.

"The Bells would rather compete against a cable TV-based local competitor [because] there is a perceived quality or reliability issue associated with cable TV," said Jeffrey Kagan, president of Kagan Telecom Associates, an Atlanta consulting firm. ■

HUNTING EVERYWHERE FOR THE BETTER MOUSETRAP

AT&T has been on a tear gobbling up companies and making deals to incorporate other vendors' hardware and software in AT&T services:



BMC Software
Signed a licensing deal with BMC Software for customer support centers that handle applications server management and monitoring.

Newbridge Networks
Aired hardware configuration and installation pact with Newbridge Networks for a managed bandwidth service.

NetOps
Signed software licensing and marketing deal with NetOps for an ongoing fault management service.

CheckFree
Partnered with CheckFree on electronic billing services.

Tele-Communications
Announced plan to buy Tele-Communications to offer residential local access.

Teleport Communications Group
Acquired Teleport Communications Group to offer commercial local access.

Visual Networks
Inked enhanced DSU/CSU installation deal with Visual Networks focused on frame relay performance monitoring.

Virtual Access
Signed joint marketing agreement with Virtual Access regarding ISDN routers for AT&T switched digital services.

HP
Established joint marketing agreement with HP on call center software and services.

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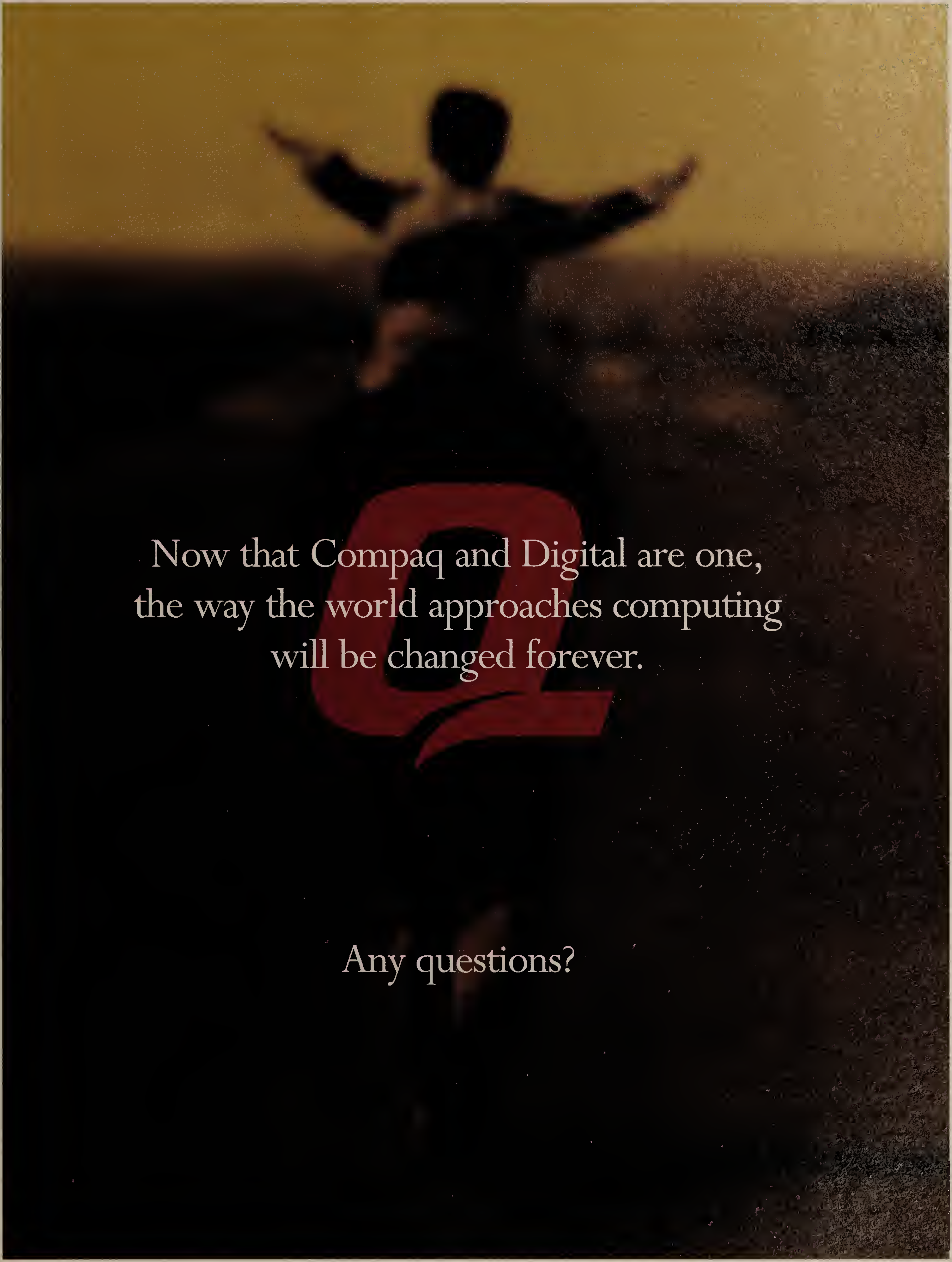
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will be changed forever.
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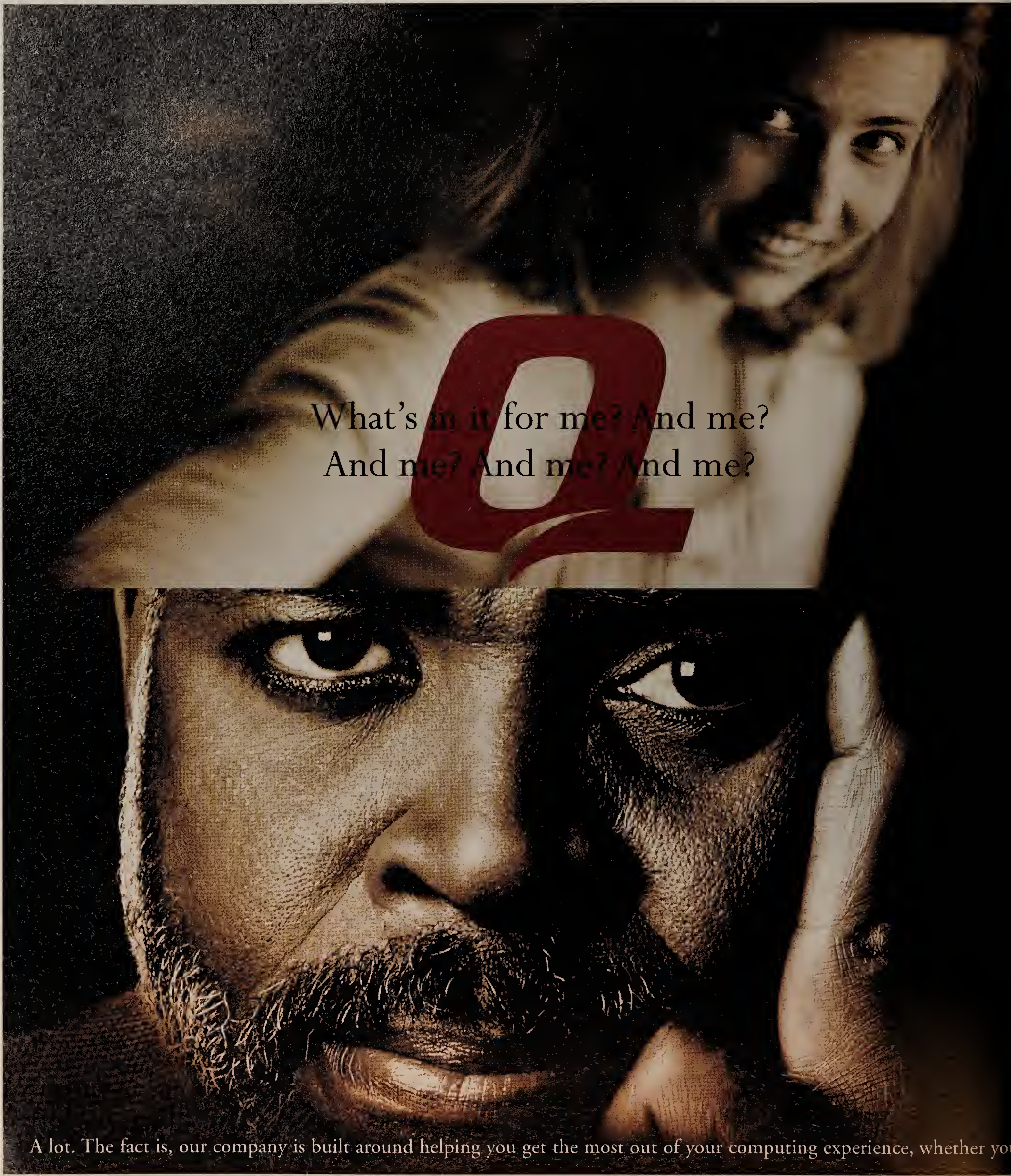


What's in it for me? And me? And me? And me? And me?

A lot. The fact is, our company is built around helping you get the most out of your computing experience, whether yo

products and services. With the richest and deepest strategic partnerships. And with the energy, commitment and passio

se one PC, or run the most complex global enterprise network. How? With the widest range of affordable, industry-standard

r useful innovation that drive the people of this company, as they seek the very best solutions to your toughest problems.

It's unlimited. We're firmly committed to all our platforms and technologies—from OpenVMS™ and UNIX® to Windows NT® an

IT investments of years past and to make them work with what you buy in years ahead. To not only drive these technologies towar

onStop® Kernel; from Intel® and 64-bit Alpha, to the platform that unites all we do: the Internet. Our aim is to protect your

ndustry standardization, but to serve as a catalyst for useful, affordable new technologies that can take you where you need to go.

Is there power in standardization?

Absolutely. When a technology achieves industry standardization, the costs and risks of using it go down, and the number o

the way in taking the best, most deserving technologies—whether for the desktop or the enterprise—and pushing them toward

ndividuals and businesses who can use it goes up. That's power. And that's one of the principles Compaq was built on. Today, we lead

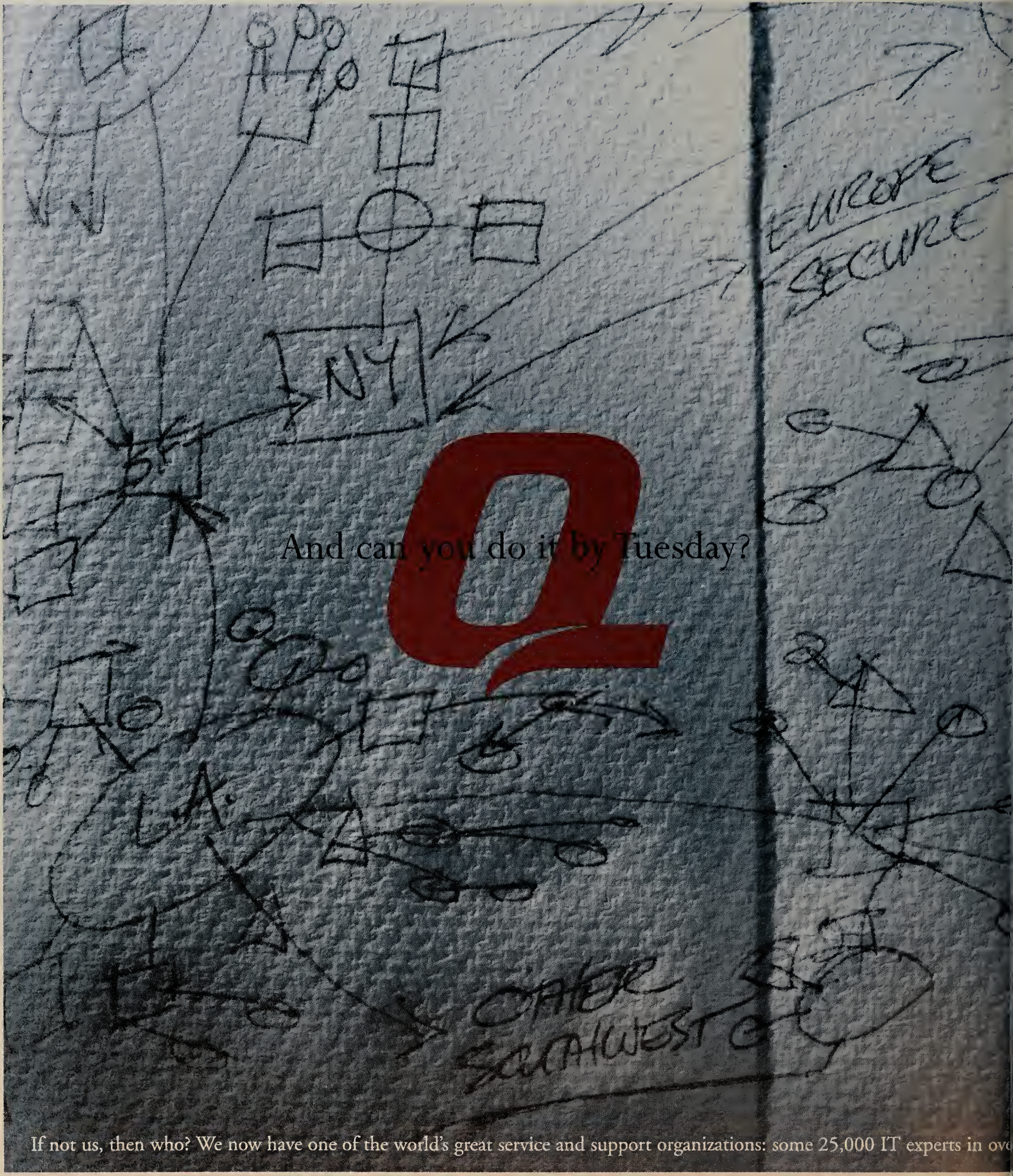
ider acceptance and greater affordability. So that more people end up with more ways, better ways, of doing what they need to do.

We are. And whether it's working with technology partners, channel partners or our customers, it's a true collaboration,

we are. And today we proactively seek the best minds in our industry, so that together we can find the best answers—

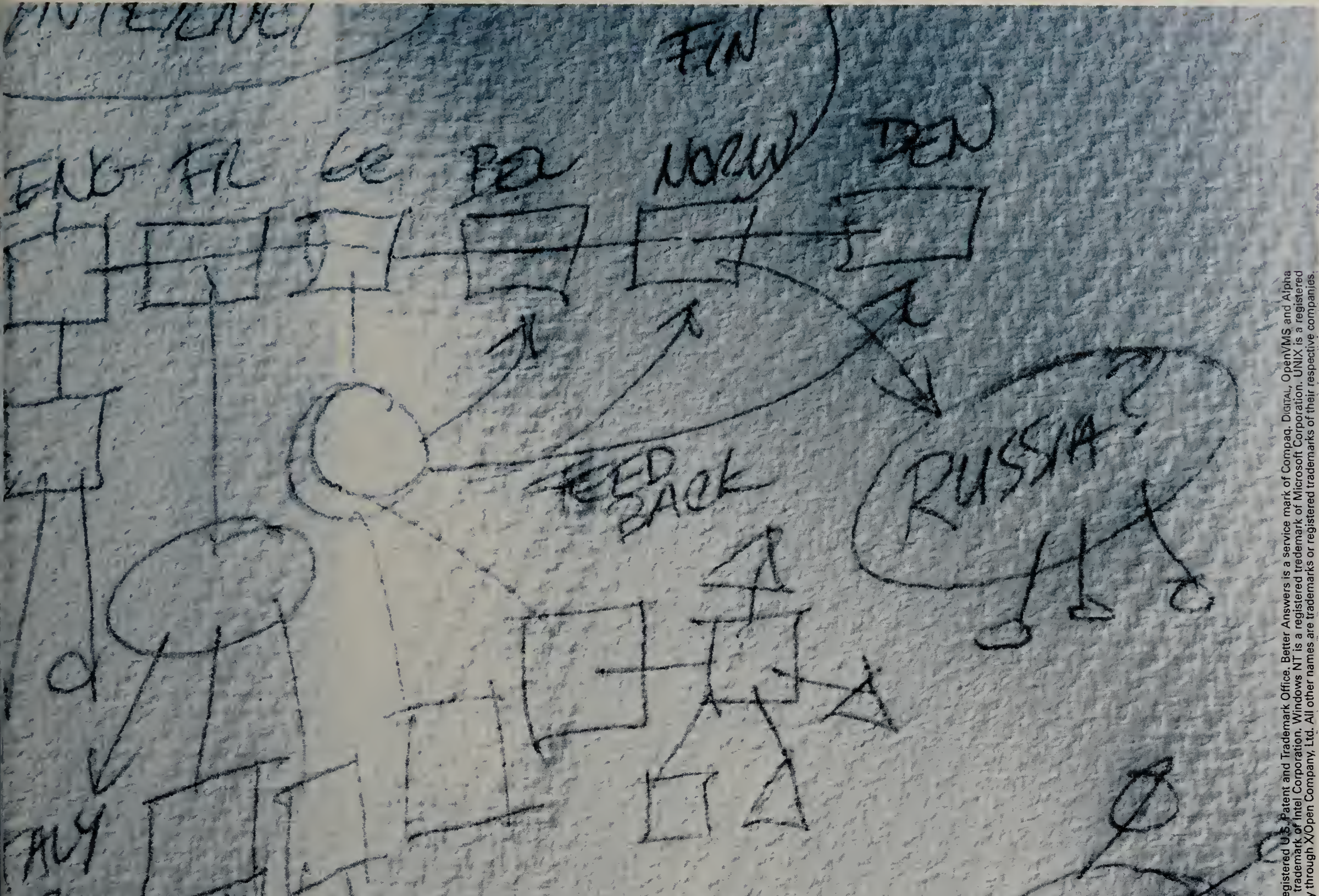
hich we help innovate, develop and fine-tune the best solutions. Leading the way in partnering has always been part of who

erything from Internet commerce to mission-critical applications in finance, communications, manufacturing and more.



And can you do it by Tuesday?

If not us, then who? We now have one of the world's great service and support organizations: some 25,000 IT experts in ov
them directly or over the Web to partners, resellers and customers at great savings in time and money. It's one example o



0 countries. We've even turned much of our experience in solving tough problems into leading-edge tools and products, offering

omething that today is more true than ever: for the best answers in information technology, it's unquestionably Compaq.

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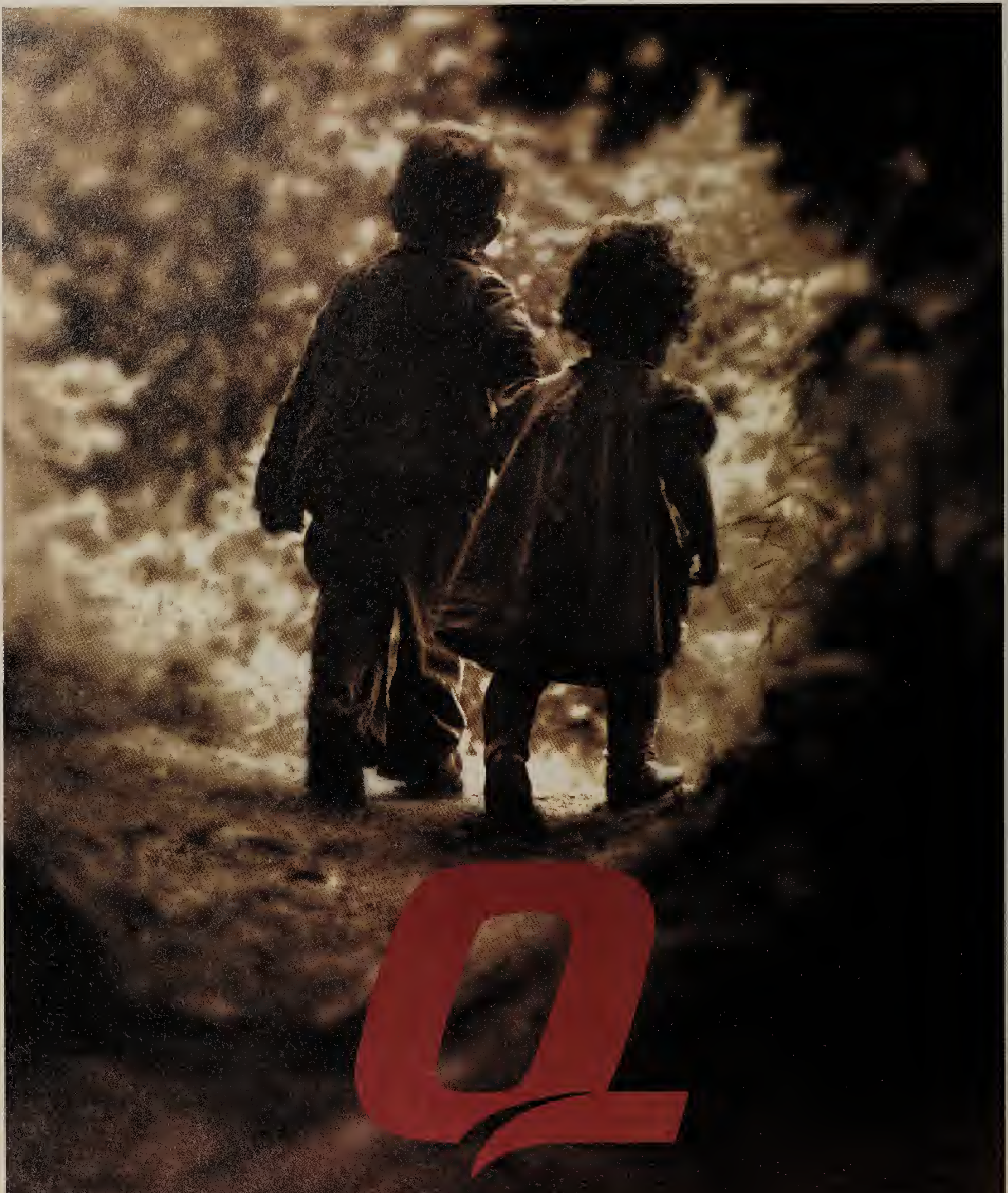

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Briefs

Linksys *has introduced a 10/100M bit/sec network adapter card for* **notebook PCs** *with CardBus adapter slots. The company's 10/100M CardBus PC Card can sense the difference between 10M bit/sec and 100M bit/sec network traffic and adjust accordingly. The card features 32-bit bus mastering, enabling the card to exchange information over a network without bogging down a PC's main processor. Available now, the adapter card costs $92.*

© Linksys: (800) 546-5797

Linksys' card *supports Ethernet and Fast Ethernet*

Alcatel *and* **Xylan Corp.** *last week said they have extended an agreement under which Alcatel resells Xylan switches. Alcatel will now resell Xylan's OmniStack line of* **workgroup switches** *as the Alcatel 1100 LSS 210 Stack series.*

Xylan's OmniStack 10/100M bit/sec stackable switches can be outfitted with ATM, Gigabit Ethernet or Fast Ethernet uplinks.

Sequent Computer Systems, Inc., *a Beaverton, Ore., server company, said it anticipates reporting revenue for the second quarter that is "significantly below management expectations."*

The company **expects to post an operating loss** *of between 25 cents and 35 cents per share and revenue of between $185 million and $195 million for the second quarter, which ends July 4. The company said its revenue has taken a hit in large part because of an unforeseen drop in product shipments to Boeing Co. Sequent said international sales are off, too.*

Sequent plans to lay off as many as 250 employees and take a one-time restructuring charge against earnings of $55 million to $60 million.

Get ready for the Xeon server parade

Compaq, Data General, IBM and others to use powerful new 32-bit Intel processor.

By Marc Songini

Intel Corp. this week will introduce the Pentium II Xeon, a server and workstation processor that's faster and more flexible than its predecessors.

Compaq Computer Corp., Data General Corp., Dell Computer Corp., Hewlett-Packard Co. and IBM will be among the companies rolling out Xeon machines to address the needs of customers looking for more powerful application servers.

Intel's new 32-bit processor is faster than the company's existing Pentium Pro processor, with a clock speed of 400-MHz compared with the Pentium Pro's maximum of 200-MHz.

Xeon is more flexible than the current Pentium II in that vendors can combine up to four Xeons in a server. They could only team up to two of the earlier Pentium IIs per server.

The 32-bit Xeon chip announcement comes in the wake of news that Intel's 64-bit chip, code-named Merced, will be delayed for at least six months.

Intel confirmed shortly before press time that some Xeon systems will be delayed as well, probably by only a few weeks. Intel discovered a bug that affects some Xeon implementations, but has already developed a workaround, a spokeswoman said.

Xeon attributes include support for 512M bytes or 1M byte of cache; later this year, the maximum cache will expand to 2M bytes. Additionally, the processor can access information in its cache at full speed, whereas the Pentium II could only do so at half of its maximum processing speed.

Xeon's bus runs at 100-MHz for speedy I/O processing. In contrast, the Pentium Pro buzzes along at 66-MHz. Xeon will be able to handle up to 64G bytes of memory.

INTEL'S XEON CHIP AT A GLANCE

- **Clock speed:** 400-MHz
- **Cache size:** Up to 1M byte
- **Scalability:** Up to four chips per server
- **Memory:** 64G bytes
- **What it replaces:** Pentium Pro

"There is always a need for more and more speed and memory," said Duncan Schleiss, director of marketing for Fisher Rosemont Systems, an Austin, Texas, hardware and software company that uses Dell servers. "What we do is pretty CPU intensive."

The Xeon processor complies with Intel's Wired For Management (WFM) initiative standard, offering administrators management information on voltage amounts, cache loads and system temperature.

While the majority of vendors rolling out Xeon servers will be running Windows NT with them, the chip has been coached to understand a variety of Unix dialects, including Santa Cruz Operation's UnixWare and Sun Microsystems, Inc.'s Solaris.

Compaq's ProLiant *servers will boost Xeon engines.*

Intel said Xeon will cost server vendors up to $150 more than what they already pay for the Pentium Pro. In other words, Intel said customers shouldn't blame the company if Xeon servers prove to be expensive.

Xeon power

While most of the server vendors are keeping their exact Xeon machine plans quiet until this week, a few companies shared some details.

Compaq plans to roll out Xeon versions of its ProLiant 6000 and 7000 servers. The machines will be geared toward handling heavy-duty applications, such as enterprise resource planning, data warehouse and online transaction processing programs.

Compaq declined to specify its pricing and availability plans for the servers.

Data General will announce a non-uniform memory access server called the AV 25000 that initially will be powered by four Xeons. The box, designed for large data centers, will run the DG/UX version of Unix. The AV 25000 will be available in September and will start at less than $100,000. ■

Get more online:
- A Xeon overview
- Our reviews of Pentium II servers

7731

www.nwfusion.com

QUICK TAKE: VNSWITCH 900FF AND 900FX

Cabletron breathes new life into FDDI

Cabletron Systems, Inc. has introduced two modules for its Multi-Switch 900 chassis that enable users to migrate from shared to switched FDDI backbone networks.

The VNswitch 900FF is a two-port switched FDDI module that costs $11,795. The VNswitch 900FX module features one switched FDDI port and two switched Fast Ethernet ports and costs $9,795. The modules support wire-speed switching as well as IP routing at 100K packet/sec.

Cabletron: (603) 332-9400

Third-party software extends reach of multiuser WinNT

By John Cox

Recognizing that many customers need access to more than just Windows applications, Microsoft Corp. has forged a series of partnerships with terminal emulation software vendors.

GraphOn Corp. of Campbell, Calif., is the latest of these partners to announce its product plans. The company recently introduced Go-Between, X Server software that lets clients access applications running on remote Unix hosts via Microsoft's Windows NT 4.0, Terminal Server Edition (TSE), which is a multiuser version of NT accessible to PCs and Windows thin clients.

Traditionally, desktop PCs have accessed Unix applications by loading the X Server program locally, said Robin Ford, GraphOn's executive vice president. The X protocol, which handles communications between the PC and the Unix host, is a chatty protocol that adds to network traffic load, Ford said.

With Go-Between, GraphOn has moved the X software to the TSE server. A very small client program remains on the desktop device, which can be a

See X Server, *page 30*

Trade group slams Microsoft for its NT practices

SPA concerned that Microsoft could wind up monopolizing messaging, electronic commerce and other application markets.

By Ellnor Mills
Washington, D.C.

The world's largest software trade association has released a paper that urges swift action to prevent Microsoft Corp. from monopolizing the server operating system market.

"The time to prevent anti-competitive distortion in the enterprise software market is now, not after Microsoft's merger of the desktop and enterprise operating systems gives it a stranglehold on both markets," concludes the 35-page white paper released by the Software Publishers Association (SPA).

The paper outlines how Microsoft is pushing into the network server and application areas by taking advantage of its dominant position in the desktop operating system market. The SPA paper states that Microsoft is establishing Windows NT as the successor to Windows 95 and 98; dictating server and network protocols to control development of the network; and using its desktop dominance to eliminate competition on the network through bundling and predatory pricing. The SPA also accuses Microsoft of manipulating standards, threatening to withdraw support for its products when customers use products from rivals and preannouncing products that may never materialize.

"Just as Microsoft leveraged control of the desktop to establish a monopoly in the business application market [word processors, spreadsheets, presentation graphics and desktop databases], its growing influence in the server operating system market positions it to monopolize the database, [World Wide] Web, transaction, communications, messaging and electronic commerce server markets as well," the paper contends.

"Microsoft's control of the desktop business application market with the Microsoft Office Suite has essentially eliminated innovation and competition in that market segment. This same threat now exists in the enterprise software market," the paper continues.

Before the SPA released its paper, Microsoft sent the group a letter accusing it of participating in an "anti-Microsoft campaign." Microsoft also sent copies of the letter, from Microsoft President and Chief Operating Officer Bob Herbold, to reporters.

The SPA's allegations

Here's what the Software Publishers Association claims Microsoft is doing wrong:

☑ Taking advantage of its desktop operating system dominance to establish a server operating system monopoly.

☑ Using monopoly power to control technical standards and specifications.

☑ Bundling applications with NT.

☑ Using predatory pricing and tying the purchase of other Microsoft products to NT to eliminate competition.

☑ Nullifying competition through preannouncements, vaporware, discontinued support and claims of incompatibility.

The letter, which was accompanied by Microsoft's own white paper on "Windows NT: Boosting Competition in Enterprise Computing," defended Microsoft's strategy of "integrating new features into its server products."

The SPA report's author said that the trade group's paper does not address feature integration but rather focuses on Microsoft's bundling practices. "The problem is when you have market power as Microsoft does, bundling becomes problematic," said Lauren Hall, chief technologist at the SPA.

Hall said Microsoft had the opportunity to provide feedback on the SPA's white paper but only issued one sparse complaint that said the paper contains factual inaccuracies.

"We felt the problems in the paper were so numerous that it wasn't productive to provide point-by-point feedback," a Microsoft spokesman said.

Microsoft's letter also alleged that the white paper was prepared by Microsoft competitors and notes that it coincided with Sun Microsystems, Inc. becoming an SPA member. However, Sun became an SPA member Jan. 16, and the white paper was conceived of around the beginning of May, according to an SPA spokesman.

The SPA white paper, titled "Competition in the Network Market: The Microsoft Challenge," is available on the SPA Web site at www.spa.org.

Mills is a correspondent with IDG News Service's San Francisco bureau.

NT server firm may close

By Marc Songini and Bob Brown
Concord, Mass.

Axil Computer, Inc., a pioneer in the eight-way Windows NT server market, may not be around much longer.

The company, which is a wholly owned subsidiary of Hyundai Electronics America, last week said it will drastically reduce its operations. Axil's board of directors has decided to eliminate all staff positions other than those involved with service and support.

Axil said it will continue to fulfill orders through July to a handful of key customers and also will provide support to its installed base.

The Axil news did not go over big with customers.

"I'm quite disappointed by this," said Chris Walsh, director of engineering at UltraNet Communications, Inc., an ISP in Marlborough, Mass. "[My Axil server] runs my back-end LAN and holds my billing system. . . . It's been a good system. My problem now is that I'm not sure where the [product line's] future lies."

There is a chance that Axil will be revived. The company's management team is exploring the possibility of buying Axil's intellectual property from Hyundai Electronics and starting up a new company called Axil2.

"We do have a couple of potential deals to keep something going. Barring those working out we are just winding things down," an Axil spokesman said. "Support could exist in some form for years. There are lots of systems out there."

Axil's demise appears largely to be the result of parent company Hyundai Electronics' financial struggles, said Laurie McCabe, an analyst at Summit Strategies, Inc. in Boston.

But the fact that customers are gravitating toward standard rather than proprietary server architectures does not favor Axil either, said James Gruener, an analyst with Aberdeen Group in Boston.

Axil's eight-way Pentium Pro Northbridge *servers were among the first such machines on the market.*

Axil's spokesman acknowledged that the company, formed in 1993, has yet to become profitable.

Axil's offerings include the Northbridge NX801 eight-way Pentium Pro server and the Northbridge NX803 rack mountable eight-way Pentium Pro server.

Axil's technology has been incorporated into products sold by the likes of Data General Corp. and Hewlett-Packard Co. Both of those firms teamed with Axil in March to form the Crossbar Coalition, a group designed to promote Axil's Adaptive Memory Crossbar as the de facto technology for eight-way Pentium Pro NT servers.

McCabe said Hyundai's decision about Axil's fate leaves Data General and HP "in the lurch," but she said both Axil partners have contingency plans. ■

X Server

Continued from page 29

traditional PC or a new Windows-based terminal. Instead of using the X protocol, the company created its own protocol that is designed to minimize demands on the network.

Users connect to TSE, click on the Go-Between icon and then connect to the Unix applications for which they have authorization. Each Unix application's user interface appears in a window that's part of the Microsoft NT Workstation 4.0 desktop display supported by TSE.

This approach is designed to give good performance without requiring users to install and run large software programs on the client. Equally important, Go-Between eliminates the need to have a separate X Server loaded on TSE for each client device that has to access Unix applications.

GraphOn charges $295 per user for the software.

Microsoft has also established partnerships with host connectivity vendors Attachmate Corp. of Bellevue, Wash., and WRQ, Inc. of Seattle. Attachmate is offering TSE-compatible host access and access management products for mainframes as well as Unix and VMS servers. WRQ has announced a version of its Reflection host connectivity software for the multiuser edition of NT.

TSE testers

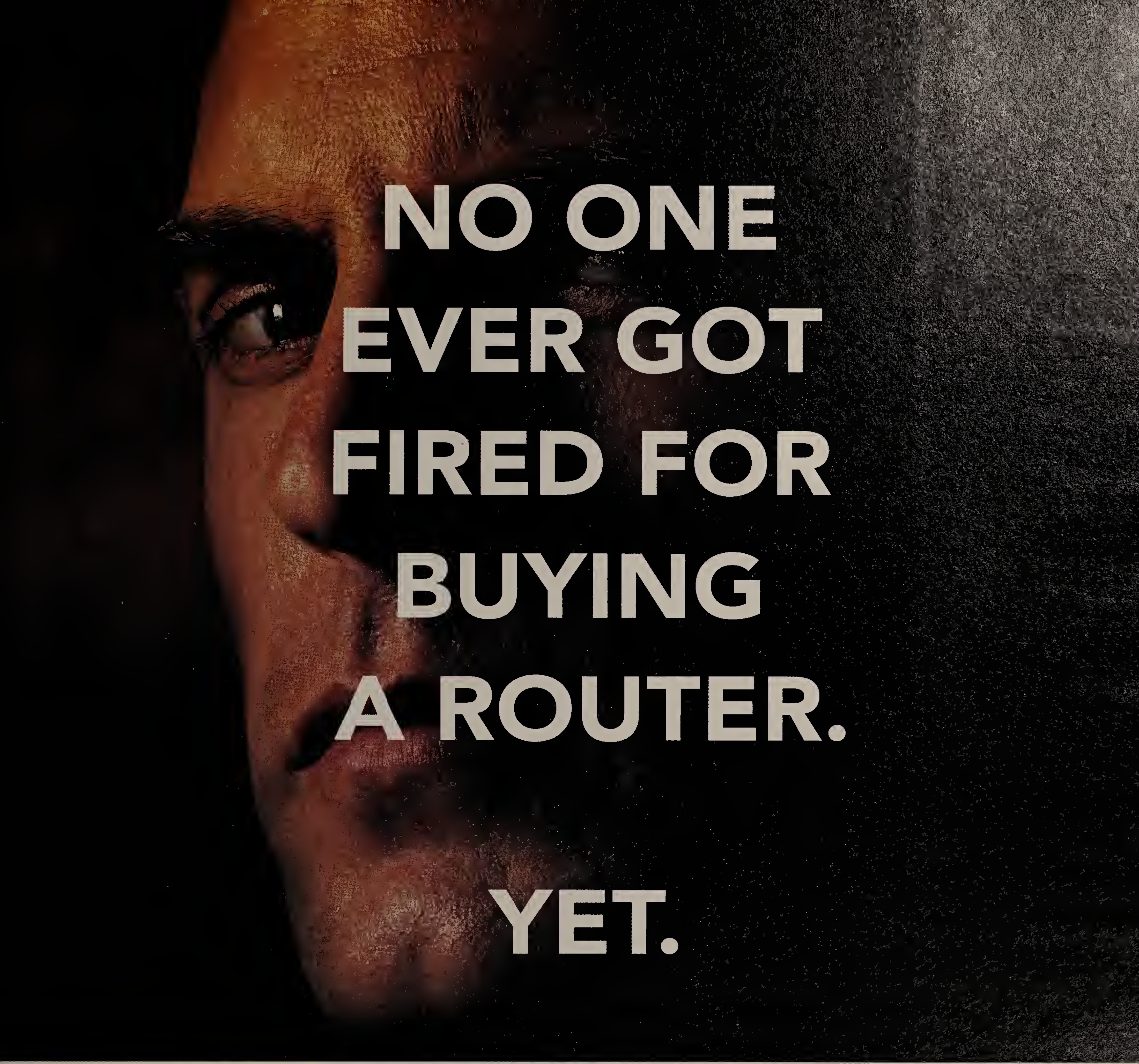
Separately, two companies have announced software compatibility testing services for TSE customers.

TSE alters some key parts of the NT kernel and many applications may have to be slightly modified to install and run properly on the multiuser NT server.

The Taylor Center for Thin Client Computing in Bedford, N.H., tests applications for compatibility with TSE. The center also measures how well the applications will scale so TSE machines can be configured accordingly.

VeriTest Corp. of Santa Monica, Calif., offers a similar program for commercial and custom-built applications.

© GraphOn: (800) 472-7466; Taylor Center: (603) 644-2141; VeriTest: (310) 450-0062



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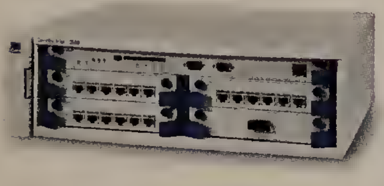

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WIRED WINDOWS

PC Expo smartens up

PC Expo has never been a hotbed of networking technology. Fortunately that's changing. This year's show in New York featured a keynote address by Novell's Eric Schmidt as well as a major networking rollout from Microsoft — Windows Terminal Server Edition (TSE). There were quite a few other network-related announcements, some of which I'll mention in upcoming Tips of the Week or the "Fusion Focus on NT" newsletter.

Eric Schmidt's former boss, Scott McNealy, is credited with coining the aphorism "the network is the computer" back in 1982. Schmidt's corollary is that "the directory is the network," and there are few within the industry who would dispute him.

Look at the facts. Novell's Novell Directory Service is used by millions; Microsoft's Active Directory is the most anticipated new feature of Windows NT 5; and Lightweight Directory Access Protocol is the most ubiquitous nontransport (that is, TCP/IP, IPX, etc.) protocol in computing today. And then there's Directory Enabled Networks (DEN). The DEN working group, now part of the Desktop Management Task Force (DMTF), is working quietly but efficiently behind the scenes to create the specification for the next generation of directories. The third iteration of the DEN spec is due any day now, and the prospect of having all network information — users, hardware, applications, services, etc. — stored in a single directory should be a reality before the end of the century. Keep a close watch on DEN. It will make your job much easier.

Dave Kearns

Another development that should help you become more efficient is the rollout of Microsoft's Windows TSE. Not to be outdone, Citrix also announced a new version of its Independent Computer Architecture terminal client for Windows CE, the operating system for handheld devices.

This breakthrough — initially to be offered by Hewlett-Packard, Philips Mobile Computing and Sharp for their handheld computers — will hasten the demise of bulky, high-priced laptop computers. Coupled with the collective yawn being given to the introduction of Windows 98, I see the business desktop coalescing around Windows CE and NT workstation.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Like many of you, the Kearns family is planning a barbecue for the Fourth of July, but the entertainment at ours will be provided by a wedding ceremony. We're one of the geekiest families on earth: daughter Maura manages a NOC; son David is Webmaster for www.golf.com; son Liam is a Silicon Valley network administrator; and daughter Katie — the one getting married — is off to graduate school to do something with proteins, DNA and computers. You're all invited to virtually attend the wedding. On July 4, around 4 p.m. CDT, point your browsers to http://vquill.com/wedding/ for almost real-time views of the ceremony. Virtual gifts not required.

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Get one step closer to the next millennium.

Get a great file/print server.

Get an outstanding application server.

Get them unified on one platform.

Get up to 20% off and a free Services for NetWare CD-ROM.

Ironic, isn't it? That an inconvenience of Y2K's[*] immensity might actually do your network some good after all. But consider it this way: since there's no getting away from that major network upgrade, maybe there's something you can get out of it. For instance, here's what happens when you upgrade to Microsoft® Windows NT® Server 4.0:

Windows NT Server 4.0 delivers proven file/print performance. Using the industry-standard Netbench performance tool, Windows NT Server 4.0 outperforms Novell NetWare 4.11 by nearly 17% in file/print throughput tests.

Windows NT Server 4.0 unifies file/print and applications on one platform. It's the ideal choice for supporting key business applications, including groupware like Microsoft Exchange Server. There are already over 4,000 applications for Windows NT Server available today. And, of course, running your applications and file/print on a common platform simplifies the management of your network—giving you more time to focus on achieving your long-term goals.

Windows NT Server 4.0 is the easy way to prepare for the future. It's already the leading intranet platform—in fact, according to IntelliQuest, it's the platform that 56% of corporate Web applications are being built on. And with features like remote access services, virtual private networking and out-of-the-box integration with Microsoft Proxy Server, you can enable cost-effective, secure communication across the Internet among employees, customers and partners. It provides exceptional Web services too—according to NetCraft, more than half a million Internet sites are currently running on Windows NT Server.

Windows NT Server 4.0 reduces total cost of ownership. A recent study by the Business Research Group compared it to NetWare in a mixed environment, and revealed that, as a unified platform, Windows NT Server 4.0 lowers the costs of providing file/print sharing and application support by nearly 20%.

And if you upgrade now you'll save up to 20% off the estimated retail price.[†] You'll also qualify for a free Services for NetWare CD-ROM (ERP $149) that makes it easier for you to transition your NetWare-based network to Windows NT Server 4.0.

So the question is not: How can I minimize the inconvenience of having to upgrade my file/print? The question is: How can I maximize the benefit of doing so? It seems that Y2K is about more than just surviving the turn of the millennium. Windows NT Server proves that it's equally about making the most of what's left of the 1900s, and getting the 2000s off to a flying start.

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[1] According to an independent study by the Dell'Oro Group.

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Briefs

Donald Haile, *vice president of development of IBM's Networking Hardware Division (NHD),* **resigned last week.**

Sources said Haile will be taking a job as executive vice president, enterprise solutions with Boston-based Fidelity Investments, the mammoth mutual funds company.

IBM named Michel Mayer, who formerly was general manager of NHD's development facility in La Gaude, France, as Haile's replacement. Mayer has been working with Haile for the past six months, so the transition should be smooth.

Haile was a 34-year IBM employee, and during his eight-month tenure as NHD 's vice president of development, oversaw the division's recent reorganization and revised product strategy.

Candle Corp. *last week said its* **Command Center Admin Pac for MQ-Series** *will begin shipping with IBM's MQSeries middleware products.*

Candle's Admin Pac will let users test, configure and manage MQSeries applications and networks.

Pricing for the Command Center Admin Pac for AIX, OS/2, Windows NT, HP-UX and Sun Solaris workstations starts at $500. Pricing for mainframe platforms starts at $10,000.

☎ Candle: (800) 972-2635

Motorola, Inc. *has signed a three-year deal under which* **Wang Global, Inc. will provide customer service** *for customers of Motorola's Network Systems Division, which sells cable modems, software modems and other internetwork gear.*

The service will be offered from 200 locations in the United States, as well as in 50 foreign countries.

The service will be rolled out over the next 60 days.

☎ Wang: (978) 967-5000

Nortel, Bay face big integration challenge

Developing a coherent product sales, service and distribution strategy a chief concern.

By David Rohde

Megamerger partners Nortel and Bay Networks, Inc. are trumpeting the lack of overlap in their product lines to help justify the deal's hefty $9.1 billion price tag.

But in one crucial area the lack of overlap could prove to be a handicap: sales and support channels. There are other challenges facing the merger, as well (see story, page 38).

While Bay's indirect sales channel consists of distributors and local value-added computer and network gear resellers, Nortel's agents are overwhelmingly resellers of PBXs and key systems from telephone companies and other traditional sources.

Analysts said the notorious, long-standing difficulty of cross-training sales and support personnel on voice and data products could slow the integration of the two companies. And that has some channel sources worried as Nortel and Bay prepare to do battle with market leader Cisco Systems, Inc.

"I'm picturing a Bay rep going on a sales call with a Nortel rep to a guy who's already got a Cisco infrastructure, and I'm wondering how that's going to fly," said Joel Embry, executive vice president of Choice Solutions, Inc., a regional network integrator based in Colleyville, Texas. "I don't see them walking into our Cisco accounts and winning their business."

Choice Solutions is a largely Cisco shop that also happens to offer multiplexing and packetized-voice equipment from Nortel subsidiary Micom Communications Corp.

Embry said the Nortel/Bay deal offers the promise of incorporating Micom technology into Bay routers so Bay can make as heavy a play as Cisco in packetized voice and toll avoidance.

Finding common ground

Number of partner distributors for Nortel and Bay products in the U.S. and Canada:

Nortel (voice products)	194
Nortel (data products)	13
Bay (all products)	103

SOURCES: BAY, SANTA CLARA, CALIF., AND NORTEL, RICHARDSON, TEXAS

But even integrating Micom into the Nortel family proved slow going after Nortel acquired the company in 1996, Embry said. For example, until recently Nortel still required Choice Solutions to maintain a separate reseller relationship with Micom.

Nortel officials acknowledged that based on experience, the integration process with Bay could take a while. Last year, when Nortel finally began offering its Magellan Passport multiservice enterprise switch via indirect sales channels, it chose only a handful of data gear resellers.

Among the few new data resellers is Williams Communications Solutions, a division of Williams Companies, Inc. that last year took over most of Nortel's direct telephony-oriented sales and has been looking to move aggressively into data networks.

"There aren't a tremendous number of voice people selling data today," said Winston Estridge, vice president of sales, marketing and operations for Nortel's Enterprise Data Networks unit. "Our channel strategy is going to be very deliberate. We're not trying to do it all at the same time."

Nortel won't be alone among the potential new internetwork powerhouses in its sales channel dilemmas. Much the same issues face Lucent Technologies, Inc. with its numerous recent acquisitions of ATM, Gigabit Ethernet and remote access companies.

As opposed to takeover veterans such as Cisco and Microsoft Corp., Lucent is expected to maintain separate channels for these acquisitions for a while, said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C.

"Lucent still has not wiped out the identity of [its acquisitions]," Dzubeck said. "They are still walking, where Cisco and Microsoft are at the running stage because they've done it so many times." ■

Bay brings portable routing code to the masses

By Tim Greene

Santa Clara, Calif.

Bay Networks, Inc. last week announced that it plans to challenge the dominance of Cisco Systems, Inc.'s IOS router code by selling portable code that is more easily integrated into third-party routing hardware.

Bay has established an independent line of business, Bay Networks Open Routing Division, which will license and sell a portable version of Bay Networks Routing Services (BayRS) software. The company also revealed it has bought phase2 networks, Inc. of Durham, N.C., and said phase2's Announce routing code features would be incorporated in BayRS.

In fact, Bay claims that half of the start-up makers of superfast Internet routers already use Announce router code in their products. Bay would not identify which vendors use Announce code, but they could include Avici Systems, Inc., Pluris, Inc., Neo Networks, Inc. and Torrent Networking Technologies Corp. Bay says more routing gear of all types is made largely from off-the-shelf components, including routing code.

PROFILE: PHASE2 NETWORKS, INC.

Location	Durham, N.C.
Founded:	1989 by a group of friends
Employees:	Five
Revenue:	Not revealed, privately held
Products:	Announce family of router software
Competitors:	Cisco, IBM

"In one fell swoop this enables half the [big, fast router] start-ups to be compatible with Bay overnight," said Paul Callahan, Bay vice president of business development.

Corporate users would benefit by having more choices when buying routers, and more innovative products to choose from, Callahan said. Users would also be ensured multivendor router compatibility should they want to mix and match routers from different companies.

"[Phase2's Announce] is a standards-based routing code easily available to anyone who needs it. Anyone can get into the routing game without having to worry about having a stable routing code," said Michael Speyer, program manager of data communications for The Yankee Group consultancy in Boston.

The pure routing aspects of Cisco's IOS routing software are so intimately entwined with the router operating system that it is difficult to figure out for third parties who may want use it, Bay said. Announce software is designed to be portable among different hardware and operating systems, so it does not have that weakness, Bay said.

This is not the first time Bay has pushed its routing code on the masses. For example, Bay provided a good chunk of routing software for Microsoft's Routing and Remote Access Service, dubbed Steelhead. The idea behind Steelhead is to turn Windows NT servers into low-end routers and remote access devices. ■

Merger gives Nortel needed IP network punch

Bay Networks technology will help Nortel branch out from ATM-centric strategy.

By David Rohde

Richardson, Texas

Contrary to appearances, Nortel's planned acquisition of Bay Networks, Inc. wasn't Nortel's entry into the world of high-speed IP switching for enterprises and carriers.

But analysts said Nortel executives apparently thought the company could not penetrate the IP market in a meaningful way without Bay's help.

For example, Nortel offers an IP access termination box called Internet Thruway, which is available to traditional carriers for their central offices and ISPs for their points of presence. But Internet Thruway is usually sold to sit in front of a traditional central office switch, such as a Nortel DMS-250, to intercept Internet access calls coming from consumers or businesses over regular analog phone lines.

"The Internet Thruway is not really designed [for pure ISPs]," said Christopher Mines, an analyst with Forrester Research, Inc. in Cambridge, Mass. "It's a way of front-ending the circuit-switched network and avoid the [local exchange carrier] meltdown problem. And even the LECs consider it a relatively clumsy and relatively expensive way to deal with the problem."

A better approach, he said, is Lucent Technologies, Inc.'s PacketStar IP switch for a separate IP POP, even if it's physically colocated within the traditional central office.

PacketStar theoretically provides thousands of queues with discrete levels of traffic priority in networks running speeds as high as OC-48 (*NW*, June 1, page 12). PacketStar is intended to compete with Cisco Systems, Inc.'s 12000 Gigabit Switch Router.

In the IP switch market, Nortel in April took approximately a 20% stake in Avici Systems, Inc., which is building a terabit routing system.

"Avici is one of the [high-speed routing] start-ups with promise," Mines said. "But Nortel is relatively late to the game."

Nortel enterprise officials face another new challenge: Keeping the company's enterprise ATM/frame relay focus, exemplified by its Magellan Passport enterprise switch, from getting lost in the merger shuffle.

Analysts said Nortel's quality-of-service story has centered around ATM. "But ATM was turning into a religious battle for them," said Christopher Thompson, a principal analyst at Gartner Group, Inc.'s Dataquest division.

Thompson noted one key signal that Nortel officials realized they were going to have to move beyond an ATM-centric strategy: Less than a month ago Nortel cancelled its Meridian Evolution ATM program. Under Meridian Evolution, users had the option of replacing the central circuit-switching fabric of Nortel's Meridian 1 PBX with an ATM switching module.

"That reflected part of Nortel's marketing problem," Thompson said. "ATM in the PBX is not really a big deal."

Still, before the planned merger was announced, Nortel dispatched Al DeLorenzi, its vice president of business who is responsible for mergers and acquisitions, to begin to rationalize the two companies' strategies.

"The IP convergence we see being driven from an application and desktop perspective," DeLorenzi said. "We see a need to provide all of those transport structures to support this."

A bigger issue than product design or timing may be simply the culture war between traditional telecommunications and network companies.

"Nortel and Lucent, and Ericsson for that matter, just aren't viewed as credible IP POP suppliers by ISPs, big and small," Forrester's Mines said. ■

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- **A look at the deal's potential impact on MCI frame relay users**
- **Latest Bay and Nortel stock news**

www.nwfusion.com

VitalSigns pack manages apps

By Robin Schreier Hohman

Santa Clara, Calif.

New management software from VitalSigns Software, Inc. should help enterprise users manage applications distributed across IP nets.

The company has introduced VitalAgent, which promises an easy way to track the performance of applications, from e-mail to database programs, running on Windows NT or 95 PCs. The idea, company executives said, is if a user encounters an application problem, VitalAgent explains what is wrong and offers the user a simple on-screen remedy to the problem, saving a call to the help desk.

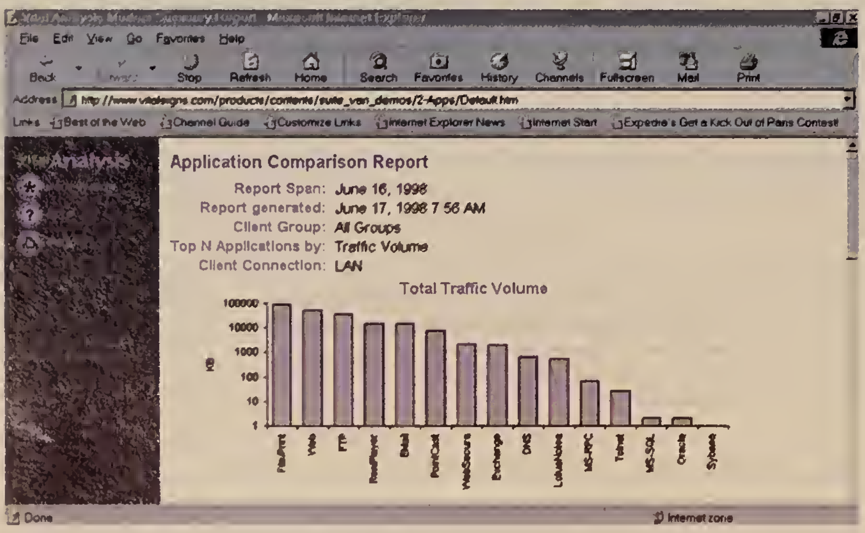
VitalAgent can also feed application performance information to administrators using enterprise management packages, such as Hewlett-Packard Co.'s OpenView. Administrators can then issue trouble tickets.

VitalAgent is part of VitalSuite, the company's flagship systems management family. VitalSuite also includes VitalHelp, a fault monitoring and remote diagnostic tool, and VitalAnalysis, a server-side reporting tool. The tools can be integrated to give users a single report on the health of their enterprise resources, the company said.

"In some ways [VitalAnalysis is] a filter for HP and Tivoli because they know nothing about the data that's coming from the agents," said Richard Villars, director of network architecture and management practice for Framingham, Mass.-based International Data Corp.

VitalAgent measures the time between the user's application request and when that request is fulfilled. VitalAgent sends that data to VitalAnalysis running on a Windows NT server. VitalSuite is shipping now and costs $15,000 for a starter kit for 50 seats.

✆ VitalSigns: (888) 884-8259



Application Comparison Report

Report Span: June 16, 1998
Report generated: June 17, 1998 7 56 AM
Client Group: All Groups
Top N Applications by: Traffic Volume
Client Connection: LAN

File Edit View Go Favorites Help
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Stop
Refresh
Home
Search
Favorites
History
Channels
Fullscreen
Mail
Print
Address http://www.vitalsigns.com/products/contents/suite_van_demos/2-Apps/Default.htm
Links Best of the Web Channel Guide Customize Links Internet Explorer News Internet Start Expedia's Get a Kick Out of Paris Contest!
Total Traffic Volume
100000
10000
1000
100
10
1
Web
FTP
DNS
Exchange
LotusNotes
MS-RPC
Telnet
MS-SQL
Oracle
Sybase
Done
Internet zone

The **VitalSigns** *analysis tool gives users up-to-date application performance info.*

Kentrox launches newfangled WAN edge devices

By Tim Greene

Portland, Ore.

ADC Kentrox this week will announce a family of remote access gear that simultaneously lets customers control their virtual private network while carriers manage the wide-area access lines for those VPNs.

The company's WANTop Boxes take on tasks typically handled by two or more devices, such as VPN boxes, routers and DSUs/CSUs.

The boxes assume the roles of routers and stand-alone VPN devices that handle firewall, encryption and IP Security tasks, imposing policies on all incoming and outgoing traffic. In addition, the remote access products function like DSUs/ CSUs in that they terminate wide-area links on behalf of carriers.

The traditional demarcation point between a WAN service and the LAN has been a termination device owned by the service provider. In the case of managed services, that demarcation has moved toward the LAN to include a WAN router.

WANTop Boxes combine Kentrox's technology with that from Packeteer, Inc. and Internet Dynamics, Inc. (see graphic).

Using Internet Dynamics' Conclave software, corporate network managers can set policies about which users or traffic types get priority over others. Traffic can be sorted by application, user or department, among other criteria.

For example, a site might be fed by a T-1 frame relay line with three permanent virtual circuits (PVC) — each for a different priority level. WANTop Boxes can map priorities set by net administrators to the appropriate PVC. Packeteer's traffic-shaping software monitors all traffic and enforces the policies set by the customer.

TEAM VPN

ADC Kentrox is teaming up with two partners to make WANTop Box, remote access gear that supports VPN services. WANTop partners and products include:

- **ADC Kentrox**
  Remote access hardware
- **Internet Dynamics**
  Security software that supports policy-based access control and encryption
- **Packeteer**
  Bandwidth management software

From the carrier side, WANTop Boxes support T-1 lines and enable carriers to define what service is deployed to the box over these lines. The boxes can be reconfigured remotely via a software download to switch from, for example, frame relay to ATM.

"This is the first product that rightfully can be called a virtual service point," said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J. "Carrier services are getting smarter, and as they do, the box between the LAN and the service needs to get smarter, too."

WANTop Boxes will be available this fall. The three models are Enterprise WANTop, which has a single T-1 port and a V.35 LAN port; Branch Office WANTop, which will include two T-1 ports and two 10/100M bit/sec Ethernet ports as well as a router; and SOHO WANTop, which will have one Basic Rate Interface ISDN port and one Ethernet port. Pricing has not been set.

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INTERNETWORKING MONITOR

Testing fast frame switches

To the casual observer, every test of a fast frame switch might appear to be a rerun of every previous test only with more or higher-speed ports. After all, the goal — wire-speed throughput — is always the same.

In reality, though, superficially similar tests using almost identical test bed configurations are often radically different. Subtle but critical changes in the input traffic can result in a test that dramatically changes how a switch is put under stress. Progress in this realm, then, is measured by achieving high throughput under increasingly adverse and demanding conditions.

Next week, I'll be at the Gignet show in Boston (www.tticom.com/gignet) presenting a tutorial called "Testing Fast Frame Switches."

Among the cosmic questions I'll be exploring is why switch A "beats" switch B in January and the situation reverses itself, say, three months later. While sometimes the answer is that a system upgrade appeared in the interim, often the reason is that the tests are actually different.

Herewith are some points I will go over in my session and you should look for the next time you evaluate test results.

Let's start with an easy one — frame size. The vast majority of tests show results of a switch processing endless streams of Ethernet's smallest legal-size frames — 64 bytes. This is not because anyone expects these in the real world. Rather, experience has shown that devices that can process small packets at wire speed can "automatically" do the same with anything larger. This is true in almost every case.

Kevin Tolly

Even in tests that process just a few streams of 64-byte packets, though, there are subtleties that affect the level of difficulty that need to be considered. Note, for example, whether the traffic is being handled in half or full duplex. It clearly is more demanding to work in full-duplex mode — transmitting and receiving — than simply performing just one of those functions.

Be aware, too, of whether traffic is statically running between pairs of ports or being directed in a complex mesh between all ports. A fully meshed configuration places a higher demand on the switch under test.

It is even important to know the physical location of input and output ports to evaluate the results properly. Note whether traffic is staying within a single module or crossing the backplane to another module. Benchmarking actual backplane capacity as opposed to its theoretical capacity is an important objective.

And as we go up the stack, the issues become more complex and esoteric. Characteristics of the Layer 3 IP stream affect test results in important ways.

For example, we've seen switch performance take a nosedive when the IP subnet addresses used in the testing were selected at random from a legal range of addresses. There are lots of other issues too. Drop by Gignet and we can talk about them.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com

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Company ____________________

Division/Mail Stop/Military Branch or Base ____________________

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If there is a parent company, please provide name: ____________________

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1. What is the principal business activity at your location?

(check ONE only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment /Recreation
06. ☐ Media/TV/Cable /Radio/Print
07. ☐ Retail/Wholesale Trade/ Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/ Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/ Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/ Communications)*
22. ☐ Other *(please specify)* ____________________

Please complete form based on largest client.

2. What is your job function?

(check ONE only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS/IT/MIS/CIO/Systems Management
5. ☐ Internet/Intranet/Electronic Commerce Mgmt., Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other *(please specify)* ____________________

3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of?

(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–N.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 to $24.9 Million
5. $1 to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A _____ Large Systems *(Mainframes/Minis)*
B _____ Desktops *(Micros/Laptops/Workstations)*
C _____ Servers
D _____ LANs
E _____ WAN Equipment
F _____ Carrier Services
G _____ Internetworking
H _____ Internet
I _____ Intranet
J _____ Extranet
K _____ Remote Access
L _____ Peripherals
M _____ Software
N _____ Service/Support

4. What is the total number of sites for which you have purchase influence?

(check ONE only)

1. ☐ 100+ 2. ☐ 50 – 99 3. ☐ 20 – 49 4. ☐ 10 – 19 5. ☐ 2 – 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization?

(check ONE box in each column)

SERVERS At Location A		SERVERS Entire Org. B	CLIENTS At Location C		CLIENTS Entire Org. D	LANS At Location E		LANS Entire Org. F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization?

(check ONE in each section)

A. At your location:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 249 or less

B. Entire organization:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

8. Please indicate the products/services that you are currently involved in purchasing or plan to purchase:

(check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

INTERNET/INTRANET

A B
☐ 01. ☐ Internet Services/Web Hosting
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Web Servers/Software
☐ 04. ☐ Web Servers/Hardware
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Voice/Video Over IP
☐ 08. ☐ VPN Equipment/Services
☐ 09. ☐ Legacy Integration Tools (Web to Host)
☐ 10. ☐ Web Development Tools (JAVA, ActiveX, etc.)
☐ 11. ☐ Push Technology
☐ 12. ☐ Web Browsers
☐ 13. ☐ Intranet Applications/Groupware
☐ 14. ☐ Search/Retrieval Products (web crawler)
☐ 15. ☐ Electronic Commerce Tools
☐ 16. ☐ Web Authoring Tools
☐ 17. ☐ Other ____________________

LOCAL-AREA NETWORKS/INTERNETWORKING

A B
☐ 18. ☐ Local-Area Networks
☐ 19. ☐ Network Operating System Software
☐ 20. ☐ Servers
☐ 21. ☐ Print Servers
☐ 22. ☐ Routers
☐ 23. ☐ ATM Switches
☐ 24. ☐ Token-Ring Switches
☐ 25. ☐ Ethernet Switches
☐ 26. ☐ Fast Ethernet
☐ 27. ☐ Gigabit Ethernet
☐ 28. ☐ Layer 3 Switches
☐ 29. ☐ Network Storage Devices (NASs, SANs)
☐ 30. ☐ LAN Storage/Backup
☐ 31. ☐ Optical Storage/Backup/ Jukeboxes
☐ 32. ☐ Disk Storage/Backup
☐ 33. ☐ Tape Storage/Backup
☐ 34. ☐ RAID Storage/Backup
☐ 35. ☐ Network Test/Diagnostic Tools
☐ 36. ☐ Cables, Connectors, Baluns
☐ 37. ☐ UPS
☐ 38. ☐ Network Interface Cards (NICs)
☐ 39. ☐ Hubs
☐ 40. ☐ Intelligent Hubs
☐ 41. ☐ Stackable Hubs
☐ 42. ☐ Bridge/Router
☐ 43. ☐ SNMP Network Management
☐ 44. ☐ Gateways
☐ 45. ☐ Concentrators/Repeaters
☐ 46. ☐ Other *(please specify)* ____________________

COMPUTERS/PERIPHERALS

A B
☐ 47. ☐ Thin Clients/Network Computers (NCs)
☐ 48. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 49. ☐ Micros/PCs
☐ 50. ☐ Minis
☐ 51. ☐ Mainframes
☐ 52. ☐ Workstations
☐ 53. ☐ Printers/Network Printers
☐ 54. ☐ CD-ROM/DVD
☐ 55. ☐ Fax/Modem Boards
☐ 56. ☐ Memory/Chips/Boards/Cards
☐ 57. ☐ Other ____________________

REMOTE/WIRELESS COMPUTING

A B
☐ 58. ☐ Remote Access Products
☐ 59. ☐ Remote Access Services
☐ 60. ☐ PDAs
☐ 61. ☐ PCMCIA Devices
☐ 62. ☐ Wireless Data Equipment/Services
☐ 63. ☐ Cellular Equipment & Services
☐ 64. ☐ Other ____________________

SOFTWARE/APPLICATIONS

A B
☐ 65. ☐ Network Management
☐ 66. ☐ Systems Management
☐ 67. ☐ Security
☐ 68. ☐ Communications Software
☐ 69. ☐ Terminal Emulation
☐ 70. ☐ Operating Systems
☐ 71. ☐ Applications Development Tools
☐ 72. ☐ Database Management/ RDBMS
☐ 73. ☐ Groupware
☐ 74. ☐ Workflow
☐ 75. ☐ EDI
☐ 76. ☐ E-mail
☐ 77. ☐ Desktop Videoconferencing
☐ 78. ☐ Imaging
☐ 79. ☐ Suites/Server Suites (Back Office, etc.)
☐ 80. ☐ Middleware
☐ 81. ☐ Document Management
☐ 82. ☐ Site Metering Tools
☐ 83. ☐ Computer Telephony Integration (CTI)
☐ 84. ☐ Data Warehousing
☐ 85. ☐ Anti Virus Software
☐ 86. ☐ Multimedia
☐ 87. ☐ Yr. 2000 Conversion Software (Y2K)
☐ 88. ☐ Helpdesk
☐ 89. ☐ Web Based Management Tools
☐ 90. ☐ Directory Services
☐ 91. ☐ Other ____________________

WIDE-AREA NETWORK EQUIPMENT & SERVICES

A B
☐ 92. ☐ 56 Kbps Modems
☐ 93. ☐ Under 56 Kbps Modems
☐ 94. ☐ Cable Modems
☐ 95. ☐ Asynchronous Transfer Mode (ATM)
☐ 96. ☐ Frame Relay Equipment/Services
☐ 97. ☐ ISDN Equipment & Services
☐ 98. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 99. ☐ xDSL Services/Products
☐ 100. ☐ Diagnostic/Test Equipment
☐ 101. ☐ DSU/CSU
☐ 102. ☐ PBXs
☐ 103. ☐ Videoconferencing
☐ 104. ☐ Leased Lines
☐ 105. ☐ Switched Data
☐ 106. ☐ Virtual Private Networks (VPN)
☐ 107. ☐ FRADs
☐ 108. ☐ Managed LAN/Router Services
☐ 109. ☐ Other ____________________
☐ 110. ☐ Outsourcing/Systems Integration Services
☐ 111. ☐ Education/Training Services
☐ 112. ☐ None of the above (1 – 111)

9. Please indicate the platforms that are currently installed/planned:

(check ALL that apply)

A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A B
☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ NFS
☐ 08. ☐ SNMP
☐ 09. ☐ Other ____________________

LAN ENVIRONMENT

A B
☐ 10. ☐ Gigabit Ethernet
☐ 11. ☐ Switched Ethernet
☐ 12. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 13. ☐ Ethernet
☐ 14. ☐ ATM
☐ 15. ☐ Token Ring/Token Ring Switching
☐ 16. ☐ IP Switching
☐ 17. ☐ Layer 3 Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ Fibre Channel
☐ 22. ☐ Other ____________________

NETWORK OPERATING SYSTEM

A B
☐ 23. ☐ Windows NT
☐ 24. ☐ Windows NT/Advanced Server
☐ 25. ☐ Novell IntranetWare
☐ 26. ☐ Novell (NetWare 5.X)
☐ 27. ☐ Novell (NetWare 4.X)
☐ 28. ☐ Novell (NetWare 2.X, 3.X)
☐ 29. ☐ Microsoft (LAN Manager)
☐ 30. ☐ Banyan (VINES)
☐ 31. ☐ IBM (Server)
☐ 22. ☐ Other ____________________

COMPUTER OPERATING SYSTEM

A B
☐ 33. ☐ NT Server
☐ 34. ☐ NT Workstation
☐ 35. ☐ Unix/Xenix/AIX/SCO
☐ 36. ☐ Solaris
☐ 37. ☐ Windows
☐ 38. ☐ Windows 95
☐ 39. ☐ Windows 98, .9x
☐ 40. ☐ DOS
☐ 41. ☐ OS/2, OS/2 Warp
☐ 42. ☐ IBM MVS/VM/VSE
☐ 43. ☐ Digital VMS
☐ 44. ☐ Macintosh
☐ 45. ☐ Other____________________
☐ 46. ☐ None of the above (1 – 45)

10. Which of the following Servers/Clients do you have installed/planned at your location?

(check ALL that apply in each column)

	A. Servers		B. Clients		A. Servers		B. Clients
Power PC	☐	01.	☐	486, 386, 286	☐	07.	☐
Power Mac	☐	02.	☐	Sun Sparc	☐	08.	☐
Mac Other	☐	03.	☐	Risc	☐	09.	☐
Multiprocessor Servers	☐	04.	☐	Alpha	☐	10.	☐
Pentium II (PII)	☐	05.	☐	Other	☐	11.	☐
Pentium/Pentium Pro	☐	06.	☐				

11. Which of the following hardware platforms are installed/planned in your company?

(check ALL that apply)

A - Mainframes (Large Scale)

1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other ____________________

B - Minis (Midrange)

1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other ____________________

C - Workstations

1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other____________________

12. What is the estimated gross revenue of your entire company/institution?

(check ONE only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13. For which areas outside of North America do you have purchase influence?

(check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

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Briefs

UUNET Technologies, Inc., *WorldCom, Inc.'s Internet subsidiary, last week announced it is upgrading its dial-up point-of-presence sites to the International Telecommunication Union's* **V.90 56K bit/sec** *standard.*

To date, UUNET has upgraded 700 of its more than 1,000 U.S. POPs. The Fairfax, Va.-based ISP expects to have its entire network upgraded by year-end.

The higher speed dial-up access is available to UUNET's current customers at no extra cost. **Earthlink Network, Inc.** *last week also announced that it has upgraded more than 700 of its dial-up POPs with software that supports the V.90 56K bit/sec standard.*

© UUNET: (703) 206-5600; Earthlink: (800) 395-8425

Concentric Network Corp., *a Cupertino, Calif.-based ISP, last week announced enhancements to its ConcentricHost shared Web-hosting services.*

Concentric Virtual Development Environment *is a new software platform that will let users more easily partition content and other resources available on ConcentricHost. The new software will be available next month.*

© Concentric: (800) 939-4262

Level 3 Communications, Inc., *is hitting the rails with its new* **nationwide IP network.**

The new carrier's wholly owned subsidiary Level 3 Communications, LLC, signed an easement agreement with Burlington Northern and Santa Fe Railway Company to install, operate and maintain fiber-optic conduit along BNSF's railway tracks.

Based on this agreement, Level 3 gets right-of-way access to the railroad company's routes in 28 states. Construction is slated for next quarter.

Concentric: Standing on its own

Company executive details future and analyzes competition.

Concentric Network Corp., like its key competitor PSINet, Inc., is one of few national ISPs not owned by a large telecommunications service provider with deep pockets. No matter though, Concentric recently drummed up $150 million by selling some preferred stock.

The company plans to use the cash to acquire technology and keep its business moving forward. In fact, just three days after Concentric announced the preferred stock sale, the company acquired Delta Internet Services, Inc., an ISP in Anaheim, Calif. John Peters, Concentric's executive vice president and general manager of network services, recently talked with *Network World* Senior Editor Denise Pappalardo about Concentric's strategies and new services.

How can Concentric remain competitive when its primary rivals are owned by wealthy telcos?

Our strategy is in adding value to basic IP transport and [also] one of differentiation. We offer high-value services based on virtual private network [VPN] software applications, we operate a higher performance network with strong SLAs [service-level agreements], and we move more quickly than our competitors because there is not a parent organization to get approval from.

You mentioned applications that you are offering to your customers. Concentric is working with Netscape and Microsoft. How do both companies' products fit into your service offering?

Our Netscape Virtual Office by Concentric service is shared by thousands of small businesses to create intranets and extranets. We also partner with Microsoft to offer users a choice when it comes to supporting an intranet, extranet or VPN. When using Concentric's Internet access combined with Microsoft's NT and/or Exchange e-mail servers, users deploy these servers at

See **Concentric,** *page 42*

In-Site

When a picture is worth a thousand words and maybe more

A group of neurosurgeons turns to the 'Net to transmit sensitive medical imagery.

By Denise Pappalardo
Boston

A picture is truly worth a thousand words, especially when it comes to your health.

Neurosurgeons at the New England Medical Center are driving this point home with a pilot virtual private network (VPN) they've developed to bring critical medical images across the Internet to doctors' PC screens.

At most emergency rooms today, doctors are left to describe CAT scan or MRI images over the phone to a neurosurgeon on call, said Jonathan Borden, a professor and neurosurgeon at Tufts Medical School and the New England Medical Center here. This puts neurosurgeons in the position of trying to diagnose or treat a patient without having some of the most important visual tools they need.

Borden and a group of 14 neurosurgeons have collaborated with VPN vendor Assured Digital, Inc. (ADI), medical software provider JABR Technology Corp. and MediaOne Group to create a VPN system that transmits medical images securely over the Internet.

With an MRI or CAT scan in hand, a remote doctor will be able to carefully and more accurately diagnose a patient before the doctor travels to the New England Medical Center.

While the VPN promises to save lives, it also promises to save money. The New England Medical Center's new VPN is about one-tenth the cost of other proprietary medical network systems, Borden said. "This package [costs] in the $50,000 to $100,000 range rather than the multimillion dollar range," he said.

Dr. Borden *says the new VPN should save lives.*

But using the Internet also opens up the network to possible security breaches, Borden said. This is why the doctors are using ADI hardware and software.

An ADI-1000 VPN switch is deployed at all of the neurologists' home offices. These devices support 168-bit key Data Encryption Standard authentication. The ADI-1000s communicate with an ADI-4500 VPN switch that is deployed at the hospital.

The combination allows the neurologists at their home offices to securely receive encrypted medical files from the hospital. And the ADI-4500 will be able to grow with the VPN when more doctors are added. The device can support up to 3,000 simultaneous encrypted sessions.

For added security, the VPN is using JABR's Synapse software, which prepares each file with a 64-character unique identifier that is attached to each medical image.

These unique identifiers are used primarily to let the neurosurgeons know that the medical image they are looking at coincides with the correct patient.

The neurosurgeons are using MediaOne's cable modem service, which supports 10M bit/sec Internet access service between the doctors' home offices and the New England Medical Center.

At this time, the hospital only has a dedicated T-1 1.544M bit/sec connection, which is causing a bottleneck, Borden said. When more doctors come online, the hospital will most likely upgrade the connection.

Borden is hoping that doctors from around the country, beyond the field of neurology, will start using the Internet to bring specialized medical expertise to rural and urban communities. ■

Concentric

Continued from page 41

[illegible] locations. Virtual Office customers access servers that are housed at a Netscape facility.

Concentric has struck deals with a variety of regional and local telephone companies to offer digital subscriber line-based Internet access by reselling [local telcos'] DSL services. How does DSL fit into your Internet access services, and how far are you from offering this nationwide?

DSL provides customers with a very high-performance, low-cost connection to our network where we can deliver value-added services.

You can use [DSL] to simply surf the [World Wide] Web, and you can use it to handle your VPN traffic, application hosting, IP telephony or video traffic. We are working in conjunction with Pacific Bell and a number of competitive local exchange carriers [CLEC] like Covad [Communications Co.] and Northpoint Communications, [Inc.]. DSL is not national yet; we plan on bringing in four or five more metro areas by the end of the year. Right now, our DSL support is exclusive to the California region.

What have been some of the most common technical issues in deploying DSL?

Qualifying each customer's copper wires. In order to support DSL, customers can't be too far from the central office [CO] switch site. And the lines between the customer and the [CO] have to be relatively clean with little to no repeaters or bridge taps.

Concentric is offering its customers SLAs on performance and availability. Where will SLAs go next?

One of the unique things we have done with our SLAs is to provide our customers with a proactive credit if we fail to meet our guarantees. In most cases, customers have to tell their carrier that they haven't met their guarantee. You don't have to beat it out of us. You will see more ISPs offering these types of proactive SLAs because customers will come to demand it. We will probably see more end-to-end guarantees that include the local loop portion of the connection.

Will you remain an independent ISP?

Well, we can actually stay independent because we will be big enough to support our interests. Carriers, CLECs and the Baby Bells, which are now teen-age Bells, are looking to acquire or build IP expertise. We're an attractive target for some of these companies, but we are not seeking a suitor.

Concentric is developing IP telephony services. Why would a business user adopt this type of service?

In the short term, to save on international telephone calls. It appears the service will save users that have branch offices in other countries a lot of money. Calls coming into the U.S. are even more expensive than international calls.

What type of IP telephony technology have you deployed?

Right now we are using technology created by Ozzy Mail, and [it has] announced relationships with Cisco [Systems, Inc.] and Bay [Networks, Inc.] to support compatible gateway technology. We are a big Bay user so we'll probably be deploying [Bay's] devices. ■

Get more online:

- The latest Concentric financial and stock news
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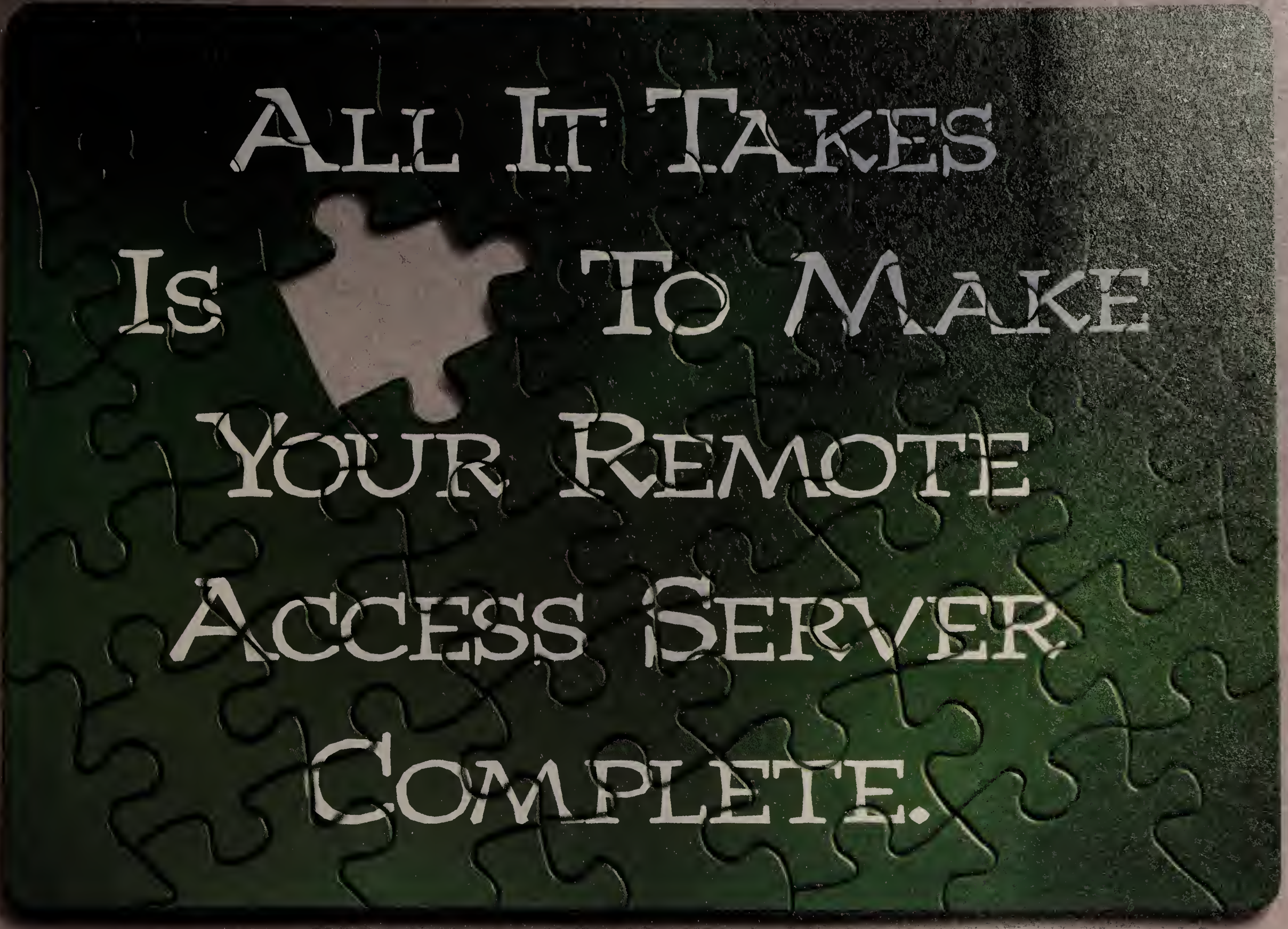

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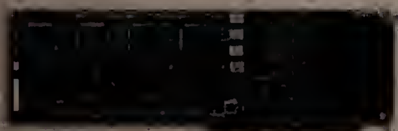

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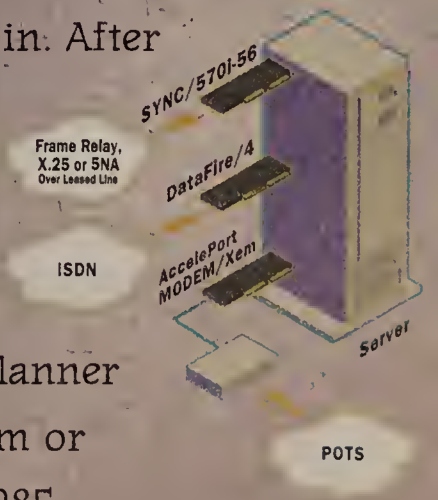

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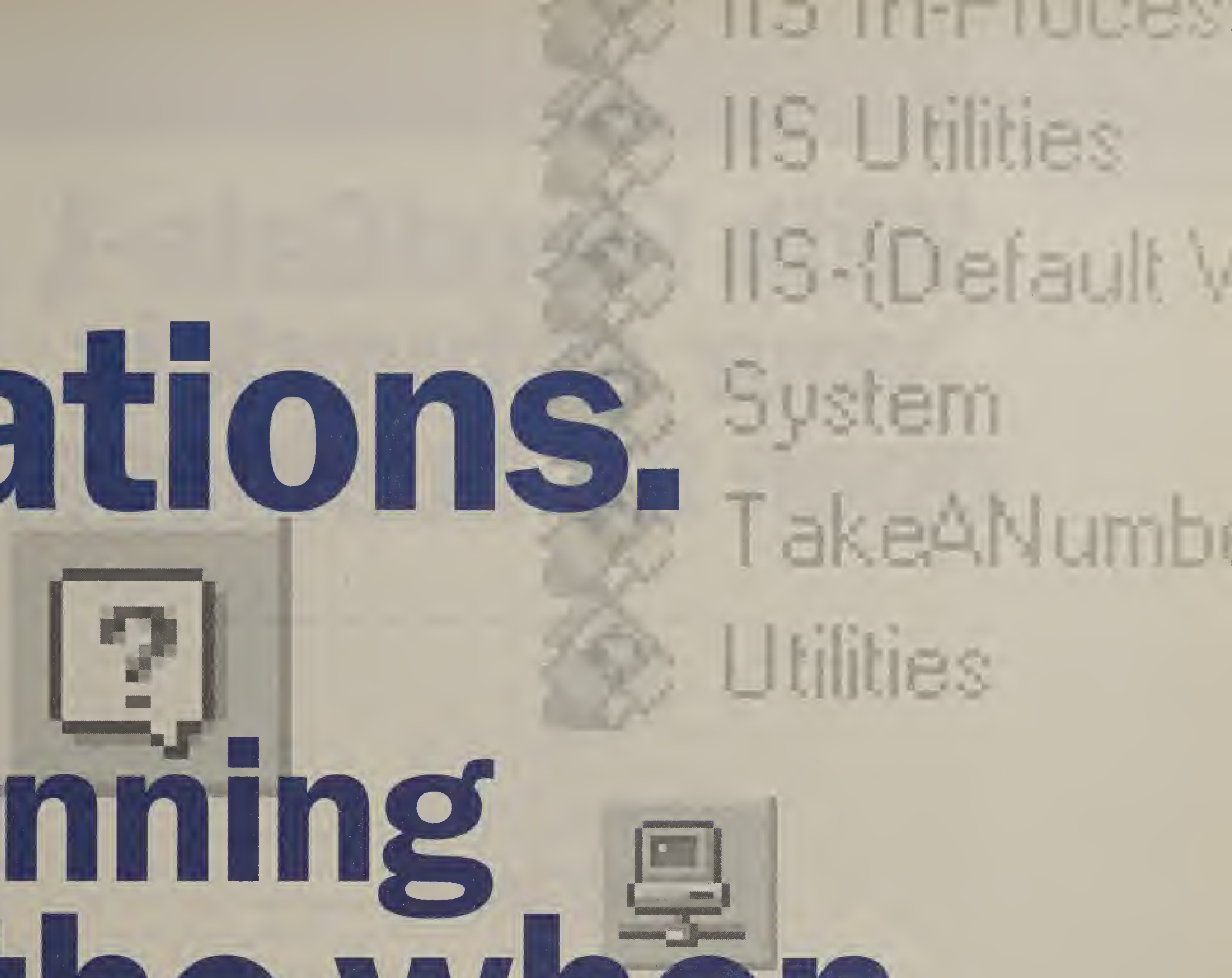

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Information and downloads: www.microsoft.com/ntserver/go/

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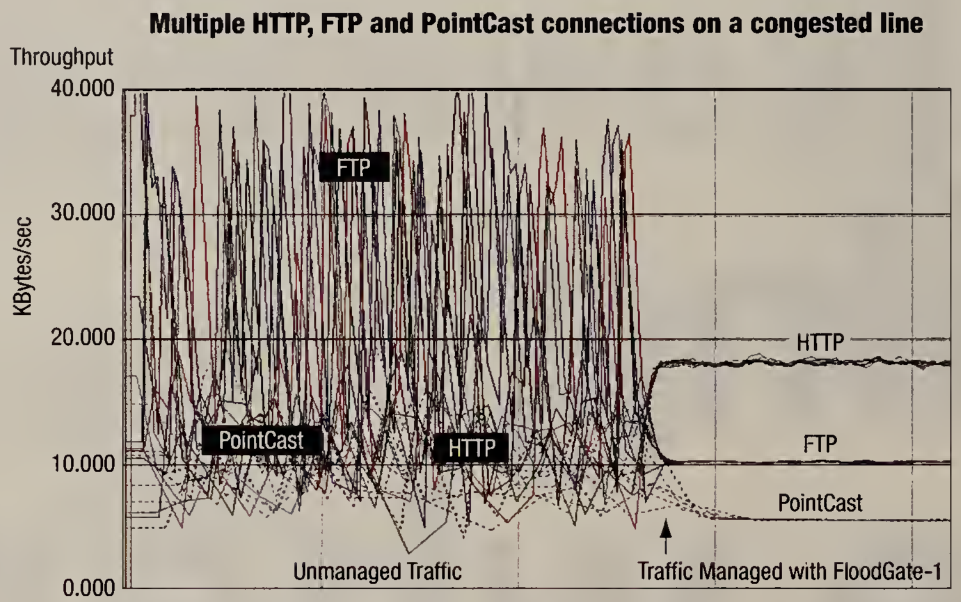
Current customers of Windows NT Server 4.0, Windows NT Workstation 4.0 and Windows® 95 can acquire the Option Pack CD-ROM for approximately $99.95 from a local reseller or at no charge from http://www.microsoft.com/ntserver/ (connect-time charges may apply).

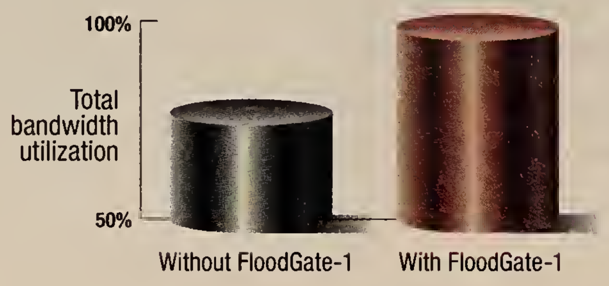
SECURE ENTERPRISE CONNECTIVITY

With FloodGate-1™, your network is open for business.



Without traffic management, applications fight for limited bandwidth and waste expensive capacity. With FloodGate-1, you can prioritize network traffic to guarantee critical application delivery and maximize bandwidth investment.

New FloodGate-1™ ensures your company's business applications get the bandwidth they need to bring in profit. By eliminating network congestion. By letting you assign higher priorities to the most critical applications, services and users. By getting the most from the bandwidth you already have, so you don't have to invest in more than you need.



Maximum bandwidth means maximum profit. With FloodGate-1, you maximize the availability and reliability of your network, which means you don't have to invest in excess capacity. More importantly, you can guarantee that mission-critical applications get the bandwidth they need when they need it, so your company always runs at maximum profitability.

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Integrates with Check Point™ FireWall-1®. Since FloodGate-1 is based on Check Point's patented Stateful Inspection technology, it can be seamlessly integrated with our market-leading enterprise security suite. This combination is the only secure, reliable Internet/intranet communications suite on the market.

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Circle Reader Service #3

INTRAnet JUNE 1998 | VOLUME 3 | NUMBER 6

INTRAnet
INTRANET DEVELOPERS TRYING TO REACH THE CROSS-PLATFORM PORTABILITY PINNACLE FACE QUITE A CLIMB
Application adventure

Cover photo: **Nick Fain**

FEATURES

COVER: APPLICATION ADVENTURE. Intranet developers trying to reach the cross-platform portability pinnacle have quite a climb ahead. Much of the journey will be uphill, but they can get there with some determined effort. 16

JUMP! In this comparative review, we examine the similarities and differences between Microsoft Corp.'s Liquid Motion and Astound, Inc.'s Dynamite dynamic site creation tools. Both are good tools for adding pizzazz to intranet pages, but our reviewer says Dynamite has a bit more punch. 11

SATISFACTORY SERVICE. With some companies operating hundreds of Web servers, we decided to survey intranet managers to see just how much they like or dislike their product choices. Here's a look at how 200 of our readers rate Web servers from Microsoft Corp., Netscape Communications Corp., The Apache Group and others. 14

BIG VALUE INTRANET ON THE CHEAP. The intranet team at marketing services and franchise giant Cendant Corp. relies on a lot of freeware, shareware and tough negotiations with software vendors to keep development costs down and business worth high. 21

DEPARTMENTS

HOT LINKS. Your virtual connection to news bits, opinion, insight, humor and other marginalia from planet intranet. 8

HANDBOOK: MULTIMEDIA WITH A SMIL. Intranet developers who want to host synchronized audio, video and text presentations on the corporate Web can put on their happy faces. The World Wide Web Consortium has elevated the well-backed Synchronized Multimedia Integration Language to Proposed Recommendation status and is testing early implementations, and RealNetworks already supports the specification in its latest product. 10

ASK DR. INTRANET. This month, the doctor discusses how to use navigational elements effectively and recommends some intranet-in-a-box packages. 23

INTRAVERT: INTRANET INFORMATION AS A SPIRITUAL EXPERIENCE. Columnist Mark Gibbs preaches on the wholly useful intranet trinity: reusability, content and business. 23

FUSION

Go online for more feature and trend pieces, product reviews, case studies and handbooks. Use DocFinder 7706 to get to our Intranet Toolkit.

PROFILE INTRANET

Scott Chin, intranet project manager, has built a sophisticated corporate Web at Cendant Corp. using a common sense approach. **Page 21.**

KEN GABRIELSEN

Intranet is a supplement to *Network World* published by International Data Group of Boston. *Network World*, 161 Worcester Road, Framingham, MA 01701. Phone: (508) 875-6400, Fax: (508) 820-3467, E-mail: nwnews@nww.com.

FROM THE EDITOR

You're looking at a revamped version of *Intranet.* We thought it time, having been publishing this monthly supplement for two years now, to fresher up its look a bit.

You'll still find the same in-depth features covering industry, technical and administrative issues, as well as the usual blend of how-to stories, product reviews, case studies and advice from Web experts. But we think this new packaging better reflects the growing vibrancy of intranets.

Actually, if your intranet isn't yet reflecting the pulse of your company, I suggest that something's amiss. Even if you are short staffed, time crunched or otherwise preoccupied, promoting the intranet throughout every echelon within the corporation ought to be one of your top priorities. Not everyone within your organization may yet have figured it out, but you hopefully have: If you're talking business-to-business electronic commerce (and what company isn't these days), you ought to be talking an intranet on the back end.

And I don't mean an intranet that's only providing basic publishing functions. That intranet role is important, to be sure. But an intranet needs to go far beyond that. It needs to incorporate, often by tying into legacy systems, the business applications driving critical operations.

Along these lines, I found some particularly compelling insight during a discussion among participants of our IntraNet Business Group (IBG) e-mail service (send inquiries on joining to ibg-admin@gibbs.com). One of the IBG members suggested that determining whether a business partner is innovative and forward thinking is simply a matter of asking if you can sit down and wander through the company's intranet. If it doesn't let you, or does and you find that the intranet is junk, then the company is probably not technically savvy.

While not every business partner needs to be on the technological edge, each one should have a good intranet. The ability to seamlessly conduct electronic business transactions may well depend on it. As the IBG participant pointed out, thoughtful use of Web technology reflects positively on how a company likely deals with business opportunities and problems in general. Sounds about right to me, how about you?

— BETH SCHULTZ, *executive editor*

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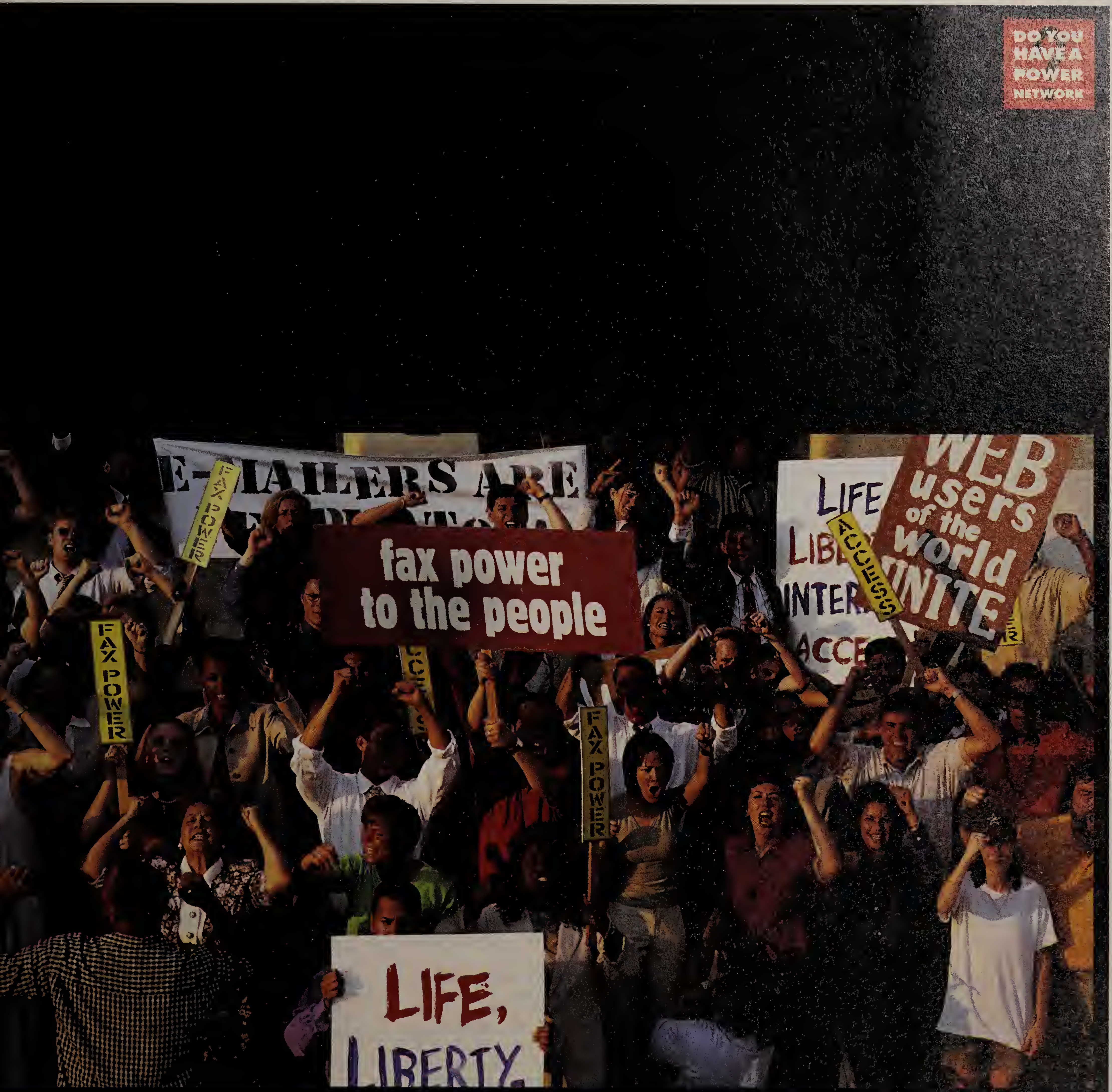

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Circle Reader Service #2

HOT LINKS

Your virtual connection to news, opinion, insight, humor and other marginalia from planet intranet

Netmosphere puts next plan into action

Imagine being able to point executives to an intranet site that provides at-a-glance updates on projects underway throughout the company. That's the aim of Netmosphere, Inc.'s new business monitoring software for corporate Webs.

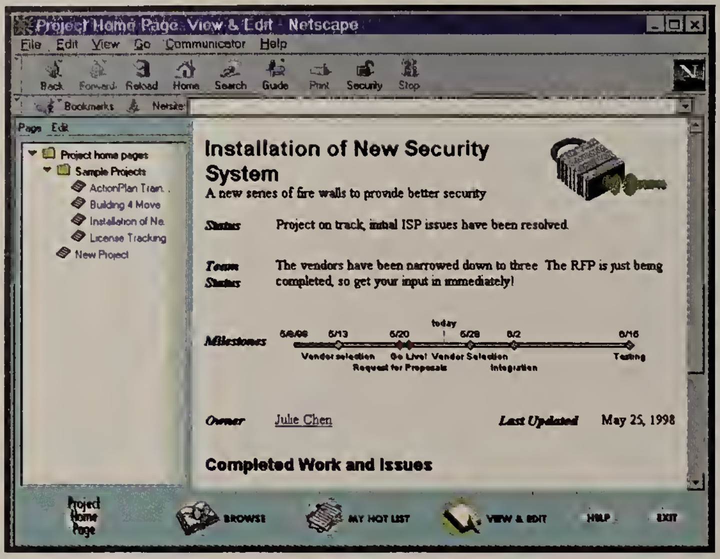
The Java application, called Project Home Page, works with Netmosphere's ActionPlan team-based project management software. The project manager can update the status of projects by importing data from ActionPlan or by entering text into a dialog box.

The project manager also determines who sees what information, says Barbara Tallent, vice president of marketing at Netmosphere in San Mateo, Calif. Project Home Page offers a view for executives who need to monitor numerous projects, one for team members and another for clients and business partners.

JWT Specialized Communications plans on using Project Home Page for the latter purpose, says Kai Yen, MIS manager for the Los Angeles subsidiary of J. Walter Thompson Advertising. "We're trying to partner with other companies to pool resources and get common goals accomplished. It seems Project Home Page will work really well to pull people together," he says.

To use Project Home Page, you need Netmosphere Collaboration Server, which works in conjunction with a Web server to provide secure login and access control. The server costs $10,000 for up to 500 users and $25,000 for up to 2,000 users.

The Project Home Page client viewers are free. The Project Home Page editor costs $1,000 per client. Users can download Project Home Page from www.netmosphere.com.



Installation of New Security System

A new series of fire walls to provide better security

Status: Project on track, initial ISP issues have been resolved

Team Status: The vendors have been narrowed down to three The RFP is just being completed, so get your input in immediately!

Milestones: 5/6/98 · 5/13 Vendor selection · 5/20 Request for Proposals · Go Live! · today · 5/28 Vendor Selection · 6/2 Integration · 6/16 Testing

Owner: Julie Chen

Last Updated: May 25, 1998

Completed Work and Issues

PROJECT HOME PAGE Netmosphere's latest software gives executives, team members or clients a snapshot of project status.

Serving up special orders

If intranets are welcome medicine for companies trying to get organized online, it's time to look for a specialist.

The basic HTTP server has become generic in its handling of fundamental tasks such as mail, proxies and caching, says Martin Marshall, an analyst with Zona Research, Inc., a market research firm in Redwood City, Calif. Companies would be wise to supplement basic Web servers with specialty servers, he adds.

As Zona discusses in its recently published "Web Application Servers: Origin of the Species" report, the hot new specialties include knowledge management, workflow, business transaction processing and host application access. Also, IT managers may need more sophisticated caching and proxy functions than the single-solution server provides.

The handiest implementations will "install and configure like Legos" so companies can build to spec, Marshall says. And, he suggests, these servers will remain specialized enough to avoid "being swallowed up in the ever-expanding jaws of operating system functionality bundling" — at least for the near future.

BASIC WEB SERVERS need specialty companions to handle advanced intranet applications, says Martin Marshall, analyst with Zona Research, Inc.

Containing the madness

NEW INTRAWARE, INC. SERVICE TRACKS INTRANET SOFTWARE.

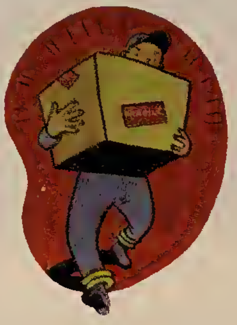
Many IT managers are working themselves into a frenzy trying to keep up with the flurry of new releases and revisions of software for the company intranet. Startup Intraware, Inc. is hoping to catch their attention before they work themselves up too much.

The startup is offering an update and management service called SubscribNet. Subscribers get update notification, electronic distribution and centralized software management for enterprise applications from some 16 companies. SubscribNet also notifies customers of incompatibilities, bugs and work arounds, says Cindy Mascheroni, vice president of business development for the Orinda, Calif., company.

SubscribNet vendors include Check Point Software Technologies, Inc., Marimba, Inc., Netscape Communications Corp., NetDynamics, Inc. and RealNetworks. The company says its goal is to support the top 50 intranet and extranet vendors by year-end.

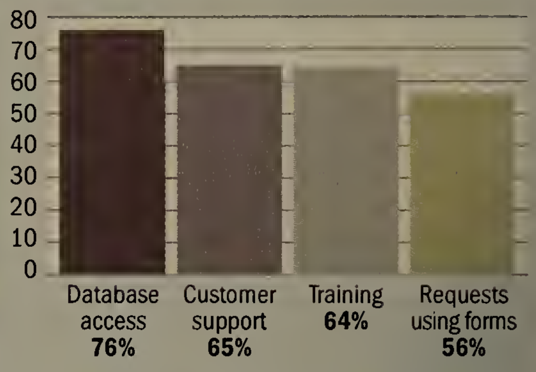
Intraware customizes SubscribNet for each customer and charges subscribers 6% of the software list price or on a per-product basis for enterprise licenses. For a guided tour of SubscribNet, go to www.intraware.com/subscription/tour/.

HOT PRODUCTS



WHO'S RUNNING WHAT?

In a recent survey, *Intranet* asked 200 intranet managers what applications they're providing via their corporate Webs. Here are the top four responses (multiple responses allowed):



(For an analysis of additional survey results, see page 14.)

QUESTION: What's the most mission-critical application on your intranet?

"A remote order-processing application that allows our affiliates to order materials from our distribution center in Mesquite, Texas. They need these materials to be successful at events for fund raising and to satisfy customer requests for information. . . . Affiliates have been able to migrate off [a legacy] VAX, saving them hundreds if not thousands of dollars in maintenance and support costs."

Ann Nurre, IT consultant
The American Heart Association, Dallas

"Timesheets. This allows all employees to enter detailed breakdowns of their work and allows managers to create powerful reports sorted by project, function, date and so on. This is mission critical for billing out our services to clients, tracking our actual vs. forecast workload and measuring profitability."

Ed Davey, knowledge manager
Syzygy Ltd., London

"OneSource, which delivers . . . marketing presentations, collateral and other sales tools and information that our sales force finds critical to its success."

Kaycee Heyer, intranet manager
Informix Software, Inc., Menlo Park, Calif.

Intranet links

Some companies heralded the intranet's arrival well in advance of others. Follow these links to some of the pioneering research:

HOT SITES

"The IntraNet Methodology: Concepts and Rationale"
www.amdahl.com/doc/products/bsg/intra/concepts1.html

"Intranet Vision and Roadmap"
www.netscape.com/comprod/at_work/white_paper/intranet/vision.html

"The Intranet: Implementation of Internet and Web Technologies in Organizational Information Systems"
www.hummingbird.com/whites/intranet.html

THE FOUNDATION OF THE INTERNET'S LARGEST HOMEBUILDER

WebFORCE® Origin™ servers from Silicon Graphics. The world's leading Internet solutions for the world's leading Internet Service Providers. Grow as fast as the Internet. Host more customers with less overhead. Do it all while spending less on your Internet server infrastructure and reducing system and network management costs. Only WebFORCE Origin servers can deliver that kind of world record price/performance, scalability, and bandwidth.

www.sgi.com/
go/webforce

Hiway Technologies

Hiway Technologies, home to over 50,000 Internet domains, relies upon the performance, scalability and reliability of WebFORCE Origin servers.

Over 50 WebFORCE Origin servers help handle more than 900 million hits per month with greater than 99.5% uptime, making Hiway the worldwide leader in Web hosting.

If you're serving mail, news, commerce transactions, databases, or caching Web content, look to Origin servers. Join the over 500 ISPs who know there is no better foundation available. We understand your business and have the satisfied customers to prove it. Remember, the Internet is booming. Your business can too, with Silicon Graphics® WebFORCE Origin Servers.

at the core of
business

SiliconGraphics

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Circle Reader Service #5

INTRANET HANDBOOK

A primer on evolving intranet standards and technology

Multimedia with a SMIL

BY MARK GIBBS

Your CEO has a flash of genius regarding the intranet: He wants to post a slideshow that employees can look at while listening to him explain his new diversification strategy.

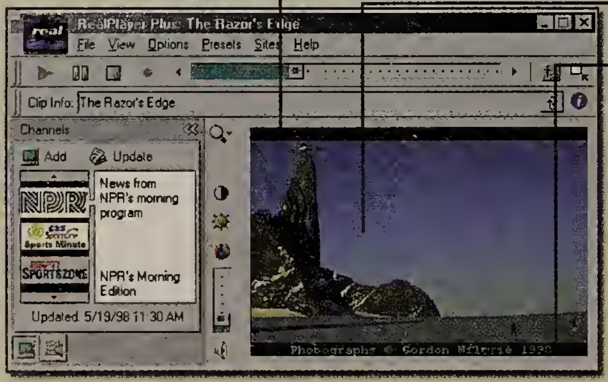
That's great, you think. You've wanted to create a snazzy multimedia application for the intranet, and synchronizing an audio track with images in the slideshow will satisfy that itch.

But your euphoria will fade, and fast, because you'll quickly find there's a major problem with creating multimedia Web presentations: It's impossible to synchronize when and where on the screen the different media are presented. And without synchronization, Web content lacks the dynamism that makes for a powerful information delivery mechanism.

Today, delivering a slideshow with synchronized audio means you have to use complex JavaScript, Java applets or ActiveX kludges. Portability among operating systems is out of the question.

THE RAZORS' EDGE

RealNetworks' latest product, RealSystem G2, supports SMIL for multimedia rendering control.


RealPlayer Plus: The Razor's Edge
File View Options Presets Sites Help
Channels
Add
Update
NPR
News from NPR's morning program
Sports Minute
SPORTSZONE
NPR's Morning Edition
Updated 5/19/98 11:30 AM
Photographs © Gordon Wiltsie 1998

Clip Info: The Razor's Edge

```
<meta name="copyright" content="The Razor's Edge"/>
<layout>
    <!-- Width, height, and background color of entire presentation. -->
    <root-layout width="300" height="204" background-color="black"/>
    <!-- Images region. -->
      <region id="images"  left="0" top="12"  width="300" height="180"/>
    <!-- Lower text region. -->
    <region id="caption" left="0" top="192" width="300" height="12"/>
</layout>

<!-- Play these groups in sequence. -->
<seq>
    <par>
        <img src="razorsedge_images.rp" region="images" fill="remove"/>
        <text src="gordon.rt" region="caption" fill="freeze"/>
        <!-- Begin audio @ 8 seconds. -->
```

But vendors and standards bodies have been pursuing a way to deliver synchronized multimedia applications on the Web. The most advanced approach is Synchronized Multimedia Integration Language (SMIL). Pronounced "smile," SMIL allows for flexible integration of multiple media streams.

The World Wide Web Consortium (W3C) has signed off on SMIL as a Proposed Recommendation and is testing early proof-of-concept implementations. An even more encouraging sign is that SMIL has gathered good industry support since becoming a working draft last November. The support comes from a number of influential organizations, including Lucent/Bell Labs, RealNetworks, Inc., Microsoft Corp., Netscape Communications Corp., Philips Electronics N.V. and Digital Equipment Corp.

The proposed SMIL standard defines how a multimedia Web broadcast is specified in a single file. This .smi file is a simple text file that you can create and modify with any text editor. The file's content is a relative of HTML.

One of SMIL's great appeals is simplicity. The specification uses only six tags, and you can harness most of SMIL's power by mastering just two of them — <parallel> and <sequential>. These define when to play media items.

The <sequential> tag is the default for untagged media items. For example, the following SMIL file will play the referenced sound files in sequence:

```
<smil>
<head>
<meta name="author" content="Mark Gibbs"/>
<meta name="title" content="The Interview"/>
<meta name="copyright" content="(c)1998 Mark Gibbs"/>
</head>
<body>
<audio src="rtsp://www.gibbs.com/introtune.ra"/>
<audio src="rtsp://www.gibbs.com/mainsound.ra"/>
<audio src="rtsp://www.gibbs.com/closetune.ra"/>
</body>
</smil>
```

The <smil> tag simply declares that the file is a SMIL specification. The header uses the standard HTML meta tags to define presentation attributes, which are global definitions unless overridden.

Overriding is easy. For example, if you need to cite a different author, you can override the attributes with a local definition. Overriding can be applied to any attribute, as shown here:

```
<audio src="rtsp://www.gibbs.com/closetune.ra"
author="William Orbit"
title="Caliente"/>
```

SMIL can use any multimedia streaming protocol but the SMIL documentation references the Real Time Streaming Protocol (RTSP) because it is the most developed. The Internet Engineering Task Force is considering RTSP, specified in RFC 2326, as an Internet Draft.

MORE MEDIA

To play media items in parallel, you would use the <parallel> or <par> tag. The following shows a file for playing an audio track along with a video and text:

```
<par>
<audio src="rtsp://www.gibbs.com/introtune.ra"/>
<video src="rtsp://www.gibbs.com/introtitles.rm"/>
<textstream src="rtsp://www.gibbs.com/headlines.rtx"/>
</par>
```

You also can define what part of an item is played, and when. Writing <audio src="rtsp://www.gibbs.com/introtune.ra" begin="6s" clip-begin="1.4s" clip-end= "15.0s"/> would delay the audio for 6 seconds, then have it play from 1.4 seconds into the data until 15 seconds into the data.

FUSION
Go online for more SMIL resources.
DocFinder: 7703

SMIL's <layout> tag specifies exactly where items will appear on the rendered Web page. This tag defines regions and attributes for the media items displayed. The <root-layout> tag specifies the entire display region size and color and then specific areas inside that are defined by name.

For example:

```
</smil>
<head>
<layout>
<root-layout background color="grey"
height="400" width="300"/>
    <region id="region1"  top="5" left="5"
    height="180" width="240"/>
    <region id="region2"top="200" left="5"
    height="25" width="280"/>
    </layout>
    </head>
    <body>
    <seq>
    <par>
    <video src="intro.rm" region="region1"/>
    <textstream src="banner.rt" region="region2"/>
    <audio src="intro.ra"/>
    </par>
    <par>
    <video src="main1.rm" region="region1"/>
    <video src="main2.rm" region="region2"/>
    <audio src="main.ra"/>
    </par>
    </seq>
</body>
</smil>
```

In the "head" section, I've defined two regions inside the main "root-layout" region. The body section assigns the playing of the media in the first <par> block and then those in the second <par> block. Note that the use of the regions can be changed as required — the first <par> block plays text in region2 while the second <par> block uses that region for video.

Another SMIL feature is the ability to specify different aspects of the connection quality and environment. This allows the server or browser to select media with the appropriate resolutions for the available bandwidth.

SMIL's future looks bright. The W3C is testing early SMIL interpreters, and RealNetworks has incorporated SMIL in its latest product, RealSystem G2 (see graphic). This is a safe starting point for experiments with synchronized multimedia presentations. ●

COMPARATIVE REVIEW

A comparison of intranet products

Jump!

ASTOUND'S DYNAMITE TOPS MICROSOFT'S LIQUID MOTION FOR ADDING ZIP TO INTRANET SITES.

BY LEE SCHLESINGER

An intranet site doesn't generally require the flash of an Internet page, but you still want one that has a bit of style.

That's the appeal of dynamic site creation tools such as Astound, Inc.'s Dynamite and Microsoft Corp.'s Liquid Motion (acquired from Dimension X). They can help you develop Web pages that have some pizzazz.

PRODUCT CAPSULE

Product	Dynamite	Liquid Motion
Vendor	Astound, Sunnyvale, Calif.	Microsoft, Redmond, Wash.
Contact	www.astound.com (408)720-0337	www.microsoft.com/liquidmotion
Price	$100	$149
PROS	Imports many graphic formats Can rescale graphics Includes basic HTML editing tools	Innovative 3-D graphic orientation tool Many bundled shapes and graphics
CONS	None significant	Complex user interface

We tested Dynamite and found that it lives up to its name with an easy interface that lets you create dynamic content quickly. Our testing revealed Liquid Motion is a typical Microsoft Version 1.0 product — it's on the right track but lacks the features and ease of use of comparable products.

Dynamite and Liquid Motion have many similarities. They let you change the appearance of buttons and other content as a mouse moves over them or as they're clicked, they import graphical and text objects and make them move around, and they publish your finished content to a Web page — Liquid Motion creates Java animations and Dynamite creates pages with JavaScript code. Pages are viewable by Version 3.0 and higher of Microsoft's Internet Explorer and Netscape Communications Corp.'s Navigator browsers.

IMPORT, SIZING AND EFFECTS

The products have their differences too. Dynamite provides dynamic page templates replete with moving images and buttons that change color. Liquid Motion doesn't provide page templates, but has animations you can modify.

And, while you can import and resize graphics files with both products, Liquid Motion forces you to specify the new size in pixels. Dynamite lets you do that, but you also can change the size by a percentage of the original.

Both programs let you associate sounds with animations, but only Dynamite lets you link in AVI, MPEG and QuickTime video, too. Dynamite also lets you apply a number of Photoshop-like effects to graphics before you place them in animations.

Placing objects means dragging them to a workspace. Dynamite lets you view a 2-D grid for precise positioning and then snap objects to the grid. With Liquid Motion, you can specify absolute pixel positions for objects individually.

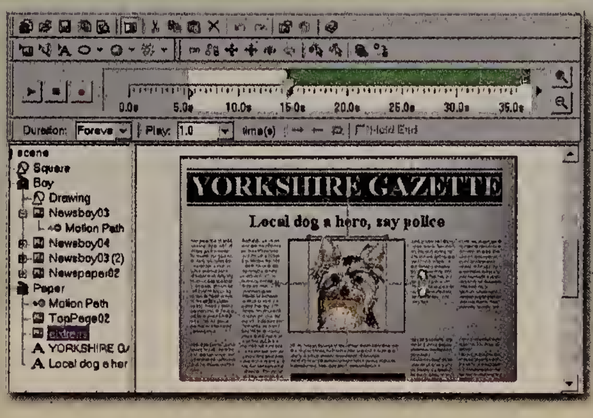
Liquid Motion and Dynamite feature timelines that let you easily see when the effects you apply to your animation start and end. And, you can specify multiple or continuous repetitions of a motion.

Once you have graphics on a page, you can define actions to occur when you position the mouse over them or click on them. You can use a number of other triggers, but many of them work only when viewed with Internet Explorer.

Dynamite is easier to use. The interface is a workspace with a toolbar at the top and a palette of special effects tools down the side. To create effects, you drag a tool from the palette onto the workspace. Right-clicking on a object brings up a context menu of all possible properties and actions you can impose on that object.

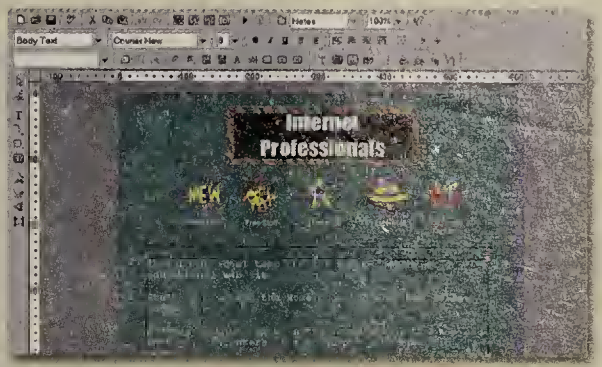
Dynamite's timeline is in a separate window rather than integrated into the main window like Liquid Motion's. There's a toolbar for setting text formatting and another for adding HTML objects.

LIQUID MOTION MICROSOFT



IN LIQUID MOTION, you can move and rotate shapes by grabbing handles at the end of axes drawn through the objects.

DYNAMITE ASTOUND



DYNAMITE PROVIDES page templates replete with moving images and buttons that change color.

THE SCOOP Product	Dynamite	Liquid Motion
Ease of use (30%)*	8	6
Bundled effects (20%)	9	9
Wizards and templates (15%)	7	5
Preview and publishing tools (15%)	9	8
Documentation/online help (10%)	9	9
Installation (10%)	10	10
Overall score	8.5	7.45

* Individual category scores are based on a scale of 1-10. Percentages are the weight given each category in determining the total score.

Liquid Motion offers a traditional Microsoft interface, with toolbars at the top, an Explorer-like tree in the left pane and a construction workspace. The product lacks a text formatting toolbar; instead, you set font attributes in a separate window when you insert text. And the product doesn't have any HTML editing utilities; Microsoft expects you to use FrontPage for page creation.

Liquid Motion builds animations based on a timeline. You can make animations appear and disappear with a multitude of transition effects. However, it has no facility for previewing animations in multiple browsers. You need to do this manually if you care what your animation will look like to someone using any browser other than the default browser installed on his PC.

The package lets you insert a variety of bundled 2-D and 3-D shapes. You can of course import images, but only in GIF or JPEG format. (Dynamite supports a much wider variety of graphic types.) You can move and rotate shapes in Liquid Motion by grabbing handles at the end of axes drawn through the shapes.

Both products are simple to install. Liquid Motion includes a helpful online tutorial and Astound provides useful tips on its Web site and includes the full manual online.

We found Dynamite gave us all we needed for virtually anything we wanted to display. Liquid Motion shows promise, but it has a bit of growing up to do. ●

FUSION

Go online to read a review of Parable Corp.'s ThingMaker, an advanced dynamic site creation tool, and to download a trial version of it and the other products mentioned. DocFinder:7702

e-business

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WITH SOME COMPANIES OPERATING HUNDREDS OF WEB SERVERS, WE DECIDED TO SURVEY INTRANET MANAGERS TO SEE JUST HOW MUCH THEY LIKE OR DISLIKE THEIR PRODUCT CHOICES. HERE'S A LOOK AT OUR RESULTS. **BY PEGGY WATT**

LIKE MANY INTRANET MANAGERS, David Summer, senior planning engineer with Blue Cross of California, runs a mix of Web server software and is generally satisfied with his choices.

With browser wars in the limelight, is anyone worrying about the back end? Not really, according to a recent *Intranet* survey, which found that intranet managers across the country are pretty satisfied with their Web server software.

The survey reveals the 200 respondents are smart buyers who shop to meet their priorities. And what these intranet managers are choosing isn't a surprise: Web servers from Microsoft Corp. and Netscape Communications Corp. dominate intranets.

Leading the smattering of other servers represented on corporate Webs is The Apache Group's freeware Apache Web Server. Runners-up of note include Lotus Development Corp.'s Domino and IBM's WebSphere Application Server.

WHAT'S IMPORTANT?

Intranet managers rate their needs for features and functions.

Built-in protection schemes	4.13 *
Scalability	4.11
Availability of service and support	4.09
Ability to customize configuration	4.07
Ease of database lookups	3.95
Quality of documentation	3.81
Log file capabilities	3.78
Product/company reputation	3.77
Financial stability of company/product	3.74
Server performance monitoring	3.71
Ease of installation	3.70

*On a scale of 1-5, with 1 being not important at all and 5 being extremely important.

Nearly one-third of those surveyed say they run a mix of Netscape and Microsoft Web servers. Thirty seven percent use only Microsoft's Internet Information Server (IIS) running (of course) under Windows NT; 19% use only Netscape Enterprise Server under Windows NT, Macintosh and Unix. Apache is in third place with 18% of the respondents using the Unix Web server.

DON'T WORRY, THEY'RE HAPPY

Who are the happiest intranet Webmasters? Apache users declared themselves a "very satisfied" 4 on a scale of 1 to 5. Netscape users placed second, but just barely, posting an overall satisfaction rating of 3.87 to Microsoft users' 3.81.

Microsoft customers represented the largest opinion spread. IIS was the only product users described as "exceeding expectations" in one feature category — ease of installation, which Microsoft has made a priority. But Microsoft's customers are also the only ones who put tallies in the category of "not at all satisfied" overall. The dissatisfied Microsoft users are only a tiny fraction — 0.8% of those surveyed — but still, no Netscape or Apache users described themselves as such.

"My fear with going with Microsoft's server is it restricts you to Windows NT," says David Summer, senior planning engineer with Blue Cross of California, a subsidiary of WellPoint Health Networks, Inc. in Woodland Hills. The company still has the Apache Web Server it started with, when Web applications were an unbudgeted IT experiment.

Microsoft clearly has entered some companies through bundling.

"We've standardized on Windows NT and IIS comes with NT, so that made the decision easier," says Ramon Castillo, an applications specialist with SmithKline Beecham Laboratories, Inc. in Tampa, Fla. He hopes Microsoft's efforts to provide all the components for an intranet will ensure compatibility and easy evolution.

Intranet managers, although a generally satisfied lot, say they'd like better service and support. "We have put some good dollars into a Microsoft support contract so we can be in a position to get what we need," says a network manager for a Midwest architectural design firm.

In addition, Microsoft and Netscape servers could use better documentation, the managers noted. Apache users didn't complain about documentation. There's a healthy selection of online resources about Apache maintained by the Web server's fans.

FUSION

Go online for more survey results. DocFinder: 7707

GOOD MATCHES

Intranet managers surveyed do have some concerns. They rank built-in protection schemes highest among their top concerns (4.13 on a scale of 1 to 5). Scalability (4.11), availability of service and support (4.09), ability to customize the system configuration (4.07) and ease of conducting database lookups (3.95) followed.

Users are equally satisfied with Netscape's and Microsoft's user authentication schemes. Apache users rate themselves less satisfied on this front, but it is a feature that both Microsoft and Netscape have emphasized in their development.

IIS users said scalability is less important to them. That's for the best, because some reviewers have taken Microsoft to task to improve that function.

Apache users, on the other hand, said scalability

JASON GROW

STUART SHULL, LAN administrator at Travis Air Force Base, says he likes the integration between Microsoft's Web and database servers.

is important to them and that their server of choice meets those needs. In fact, Apache's fans are more satisfied than users of the other two vendors' products in this category. This isn't too surprising, however, since Unix is known for its scalability.

Likewise, Apache users are happier than IIS or Enterprise Server customers about customization options, a factor listed as important by all users.

"We're connecting more and more of our databases to the intranet," says Stuart Shull, LAN administrator at Travis Air Force Base in northern California, speaking of his need for customization options. The IIS integration with SQL Server and Access helps make that easier, he says.

"Database lookup gets more important all the time," says Dale Van Aman, manager of network services with Brown-Foreman Corp., a whiskey distiller in Louisville, Ky. As it builds extranet sites for partners and customers, the company is developing Web access to its databases.

"We want to use standards that are going to be around in the future," Van Aman says. The company standardized on Microsoft products.

Also mentioned as priorities were log file capabilities, reputation of the vendor and the product and the vendor's perceived financial stability.

Buyers who weighted the reputation of the company and its products as important are more likely to go with Microsoft; those who named the vendor's financial stability as a consideration indicated they chose Microsoft or Apache before Netscape.

WHAT'S NOT A BIG DEAL?

News service readers trailed the list (rating only 2.46 on the 1-to-5 scale), underneath mail services (3.20) and the ability to support remote content (3.35).

Interestingly, price was not an issue for most of those surveyed (3.60 on the importance scale) — and cross-tabulations of the survey results showed — surprise! — that those for whom price was an issue are more likely to choose Apache. ●

WHO'S HAPPIEST?

According to users who rated these functions their top priority, those who used the following vendors' products were the most satisfied.

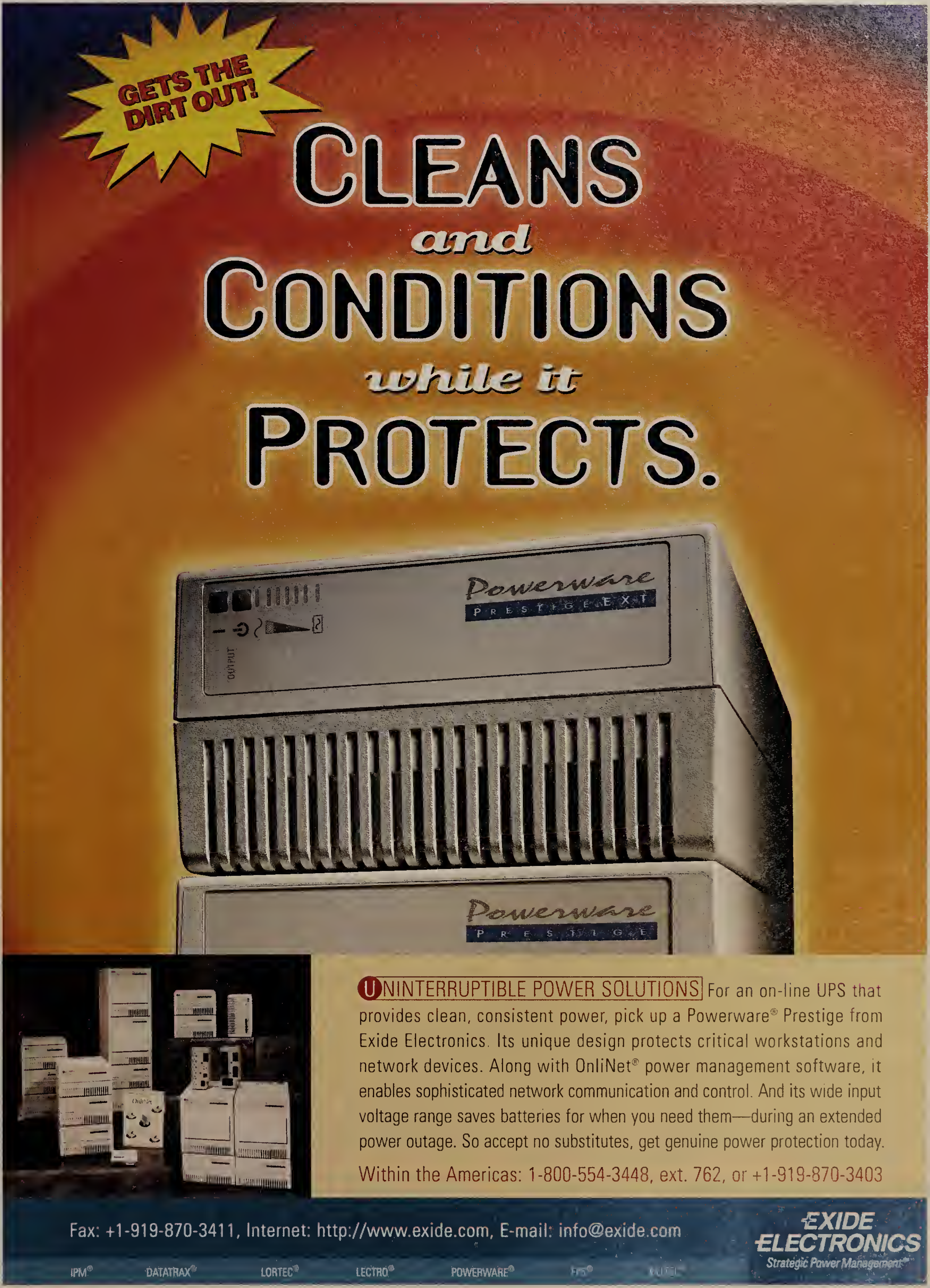
Built-in protection schemes	**Netscape**
Scalability	**Apache**
Availability of service and support	**Netscape**
Ability to customize configuration	**Apache**
Ease of database lookups	**Microsoft**
Quality of documentation	**Apache**
Log file capabilities	**Apache**

WHAT WORKS BEST?

Managers rate the features with which they're most satisfied.

Netscape Enterprise Server	**3.87 ***
Company/product reputation	3.99
Ease of installation	3.85
Scalability	3.80
Ability to customize the server's configuration	3.78
Built-in protection schemes	3.77
Microsoft IIS	**3.81**
Financial stability of company/product	4.42
Company/product reputation	4.06
Ease of installation	3.95
Price	3.92
Built-in protection schemes	3.76
Apache Web Server	**4.00**
Price	4.15
Scalability	3.90
Ability to customize the server's configuration	3.87
Ease of installation	3.74
Company/product reputation	3.74
Log file/analysis capabilities	3.74

*On a scale of 1-5, with 1 being not satisfied at all and 5 being extremely satisfied.



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Application

COVER STORY

INTRANET DEVELOPERS TRYING TO REACH THE CROSS-PLATFORM PORTABILITY PINNACLE HAVE QUITE A CLIMB AHEAD — BUT THEY CAN GET THERE WITH SOME DETERMINED EFFORT.

BY JAMES KOBIELUS

NICK FAIN

Authoring attractive HTML Web pages is nothing special anymore. Many a novice departmental manager has done it, and posted his handiwork for the whole company to see.

What's much more challenging — and the province of experienced developers — is designing full-fledged, enterprise-grade Web applications. These are applications that take advantage of Dynamic HTML, Cascaded Style Sheets (CSS), Java applets, JavaBeans, complex scripting, streaming real-time video and audio, transaction security and legacy database integration.

Equally as challenging is testing these applications in the various client environments through which users might access them. Also part of the fun is maintaining these applications, the sites on which they run and the fresh content they feed to a waiting world.

SIMPLE IT ISN'T

A few years ago, we all heard and many bought into Sun Microsystems, Inc.'s "write once, run anywhere" Java philosophy. We were seduced by Java's promise of easing the development burden for applications designed to run on diverse platforms.

Ironically, now that Java has established itself as the Web's dominant programming language and component technology, people don't much emphasize cross-platform development. Most experts laugh off the notion of write once, run anywhere as unattainable. Few can recommend any Web development tools or guidelines for realizing this ideal.

Cross-platform Web application development guidelines change as rapidly as browsers and Sun's Java Development Kit (JDK), says Philip Costa, industry analyst with Giga Information Group in Cambridge, Mass. And that's not even taking into account the different scripting languages and HTML versions and extensions supported by various clients, he adds.

It's not that cross-platform intranet applications aren't possible, but that the state of Web development tools and technologies in general — and Java in particular — has gotten pretty messy.

We all know how the Java world has fragmented into increasingly centrifugal camps around Sun, Netscape Communications Corp., Microsoft Corp. and other major players. All pledge nominal loyalty to the notion of a single set of Java standards. Yet the fact that no two Java software vendors offer the same set of templates, Beans, classes, methods and other features means that developers, if they can at all, must address write once, run anywhere through painstaking application planning, design and testing.

What's more, experts often overlook another more fundamental factor while discussing cross-platform application development. Java, for all its burgeoning diversity, is only one detail on a complex canvas.

Often, the best you can do given limited time and development resources is optimize an application for a particular client and pray that pages display and components execute reasonably well in other environments. Every client environment consists of a special blend of operating system, browser, Java Virtual Machine (JVM), Just-in-time (JIT) compiler, plug-ins and other technologies necessary to execute and display Web pages and components.

One noteworthy development in this regard is Sun's recently announced Java Plug-In, which pushes the most recent JVM to a browser in real time.

"Java Plug-In is good news because it allows developers to make sure downloaded applets execute in a standardized JVM," says Jeff Tash, president of Hewitt

EDWARD CALDWELL

JAMES BUSZARD-WELCHER, *chief technology officer at Silicon Reef, Inc., says developers at his firm concentrate on server, not applet, programming.*

adventure

Technologies, a Waltham, Mass., consulting firm.

There's also a third reason why we've relegated cross-platform support to the back burner. The universe of Web application development tools, techniques and technologies is growing rapidly and developers want to push the state of the art with interactivity and multimedia features.

But intranet developers must focus on creating sophisticated, data-rich applications as efficiently as possible without greatly compromising cross-platform portability. Increasingly, developers are attempting this balancing act while pursuing three fundamental development strategies:

- First, partitioning Web applications to run across the three distributed tiers of browser, Web server and database server.
- Second, serving jazzed-up Web pages to clients capable of displaying and executing objects tagged in enhanced markup languages and able to handle sophisticated style sheets, scripting languages and downloadable executables.
- Third, building and deploying Web applications as sets of reusable, interlocking, interoperating components, such as JavaBeans and Enterprise JavaBeans (EJB), at the client, Web server or database server tiers.

FUSION
Go online for more information on:
▌Browser compatibilities
▌Leading JavaBeans IDEs
DocFinder: 7705

PARTITIONING WEB APPLICATIONS

Under the partitioning development strategy, the client/browser (tier one) operates as a container for objects — principally HTML pages, GIF images and Java applets — downloaded from the Web server (tier two). The Web server, in turn, links through script programs, such as Common Gateway Interface (CGI) and Perl, to an external database server (tier three) that fetches records and fields in response to SQL queries. The Web server formats the query results into HTML pages and tables, which it sends to the browser for display.

This approach is by far the most popular configuration for intranet, electronic commerce and other dynamic data-driven Web applications typically requiring scalable access to one or more legacy databases. The database-integrated Web server does the heavy processing. It collects, merges and formats database query results into basic HTML and GIF documents for delivery to browsers, sometimes as plain text and sometimes in encrypted form using Web security protocols.

This architectural approach facilitates development of a consistent cross-platform look and feel for mainstream corporate database applications ported to the intranet.

By exercising only the lowest common denominator of functionality in the browser/client tier — the "thin" HTML client — developers have greater assurance that Web applications will display and execute approximately the same everywhere. All or most of the business logic is implemented and executed at the Web server, based on database connector interfaces and tool-based application templates.

Templates, such as those found in Microsoft's Active Server Pages (ASP) and Allaire Corp.'s Cold Fusion, provide visual tools for implementing the most common server-based database, security and other application features. For example, an electronic commerce application might include template-driven features for managing electronic catalogs; accessing product, user, pricing, inventory, promotion and shipping information; and defining order-processing workflow with business rules.

Developers at Silicon Reef, Inc., a Web firm in San Francisco, like this server-programming approach. By focusing on database integration and programming Java applications at the server level, rather than working with applets, the developers don't have to center as much on what's happening at the client level, says James Buszard-Welcher, chief technology officer at Silicon Reef.

To make data-driven three-tier applications practical, you need some way to connect Web and database servers effectively for online transaction processing. Connectivity software must translate user information requests into queries that the database can execute and return database results in a format that the Web server can process and deliver to the browser.

CGI is the most common Web server software interface specification. It lets developers create Web pages that return data based on user input, calling a compiled C program or Perl script to access databases and other data sources. But with CGI, a Web server must launch a new process every time it receives a request. This limitation bogs down CPU, memory and disk utilization when a server must handle hundreds or thousands of simultaneous database transactions.

A more scalable interfacing approach is provided via Web server vendor APIs. These APIs provide shared executable libraries available to all applications running on the server. Unfortunately, this approach generally commits you to running the application on the respective vendor's Web server software.

The most common database-server API is Open Database Connectivity (ODBC). However, ODBC is increasingly taking a backseat to the upstart Java Database Connectivity (JDBC), which interfaces applications to databases by means of standard Java programming classes and methods.

JDBC is supported in Sun's JDK Version 1.1, which is included in all commercial Java integrated development environments (IDE). These are software packages that facilitate creation and maintenance of attractive, dynamic, interactive, multipage Web applications. JDBC drivers, written in Java, can be downloaded as part of an applet or installed on a machine for bridging to existing database access libraries.

Your Web server applications and source databases will need to communicate either through matching software driver configurations, such as ODBC to ODBC or JDBC to JDBC, or through a software bridge that converts from one driver standard to another or to

BROWSER INCOMPATABILITIES

For the most part, Microsoft's Internet Explorer and Netscape's Communicator are whole different animals.

	Description
Web page formatting and tagging	• Differ on some HTML 4.0 and Dynamic HTML standards, including features such as the Document Object Model, layers, enhanced frames, enhanced tables, dynamic positioning, data binding, downloadable dynamic Web fonts and international character support. • IE 4.0 implements (prestandard) XML, while Netscape promises XML 1.0 support in Communicator 5.0. • IE 4.0 displays a wider variety of native document formats out of the box than Communicator.
Style sheet format	• IE 4.0 supports the CSS2 layout standard for handling frames, floating frames, multicolumn layout, 2-D direct placement of elements, and ordering and overlapping of elements.
Multimedia format	• IE 4.0 distinguishes itself over Communicator by supporting Microsoft's DirectX APIs and multimedia class libraries, providing native QuickTime and MPEG video playback, and supporting multicast applications.
Run-time environment	• IE 4.0 supports integration of Java with the Windows platform through proprietary J/Direct technology, while Communicator uses the Java Native Interface classes shipped with Sun's Java SDK 1.1. • IE 4.0 supports installable JIT compilers. • IE 4.0 supports resumption of partial downloads on File Transfer Protocol and HTTP connections, while Communicator supports this capability only for FTP.
Scripting language	• IE 4.0 supports Microsoft's Jscript variant of the ECMAScript standard, while Communicator supports the more open JavaScript 1.2 variant. • IE 4.0 supports scripting of Java applets via JScript and VBScript, while Communicator supports just JavaScript 1.2. • IE 4.0 supports a proprietary 'scriplets' feature for which Communicator has no counterpart. • Communicator supports scripting of plug-ins.
Security	• IE 4.0 supports Microsoft's Authenticode, Security Zones and CryptoAPI security technologies.
Object technology	• IE 4.0 supports Microsoft's COM/DCOM distributed-object technology instead of the Internet Inter-ORB Object Protocol and Remote Method Invocation technologies defined under the Java umbrella and supported in Communicator. • IE 4.0 supports ActiveX technologies. • IE 4.0 supports Microsoft's Application Foundation Classes, while Netscape supports the industry-standard Java Foundation Classes and its own Internet Foundation Classes. • IE 4.0 supports Microsoft's J/Direct technology, which lets developers call any Win32 API from Java.
Push channel definition	• IE 4.0 supports Microsoft's Channel Definition Format push specification, while Communicator adheres to Netscape's Netscaster technology.
Software distribution package definition	• IE 4.0 supports automatic software distribution through the XML-based Open Software Description. • Communicator relies on Marimba's Castanet technology for this functionality.

the native software drivers provided by relational DBMS vendors.

Most Java IDEs support all of these database connector options and usually provide a run-time license to a relational DBMS to support application development. Some database connector software requires that database driver and client software be installed on each client accessing a particular relational DBMS.

Depending on the number and variety of external databases accessed by your Web server, you may need to invest in software that translates between any of several database drivers. The need for this type of middleware will disappear as more relational DBMS vendors provide native JDBC drivers to match the JDBC drivers in Web browsers and servers.

As you bring more distributed databases into your Web application, you may need to consider another layer of middleware in transaction servers such as Sybase, Inc.'s Jaguar CTS and Microsoft MTS. These transaction monitors support high-performance, scalable, secure, multiplatform, distributed enterprise transactions across networked data stores. Transaction servers support server-based concurrency control, transaction logging and rollback.

Once you've figured out this data-connection plumbing, you can begin integrating data stores with your Web servers. Most Web development IDEs provide sophisticated visual tools for importing, defining, dragging, dropping and customizing data objects in Web applications.

Enterprise-grade Web development tools offer rich database integration features on par with the best in the industry. They support visual creation of tables, stored procedures, triggers and business rules, as well as testing, debugging and tuning of SQL queries.

JAZZING UP WEB APPLICATIONS

Under the jazzing development strategy, the client/browser becomes a more versatile container for objects delivered over the Web. Application developers leverage sophisticated HTML 4.0 or 3.2 features, including forms, tables, frames, absolute positioning, 3-D overlays, CSS, transition effects, drag and drop, data manipulation, data binding and downloadable run-time fonts. Soon, they'll also have to make full use of the new, versatile Extensible Markup Language (XML) 1.0 standard, which tags data objects within Web pages and facilitates powerful searching, indexing and querying of data.

XML Supporters

Development tools that already use XML or will soon do so include:

- Adobe's FrameMaker and FrameMaker+SGML
- Allaire's HomeSite 4.0 and Cold Fusion 4.0
- ArborText's XML Styler
- DataChannel's XML Development Kit
- Inso's DynaTag 4.0, DynaBase 3.0, DynaText 3.1 and DynaWeb
- Media Design in Progress' XPublish 1.0
- Microstar's Near & Far Designer
- SoftQuad's HoTMetaL Pro
- Vignette's StoryServer 3.2
- WebMethods' Web Automation Toolkit

XML lets Web developers define flexible, object-oriented document meta data formats for diverse applications. Web pages embedded with XML data tags can be browsed, searched and processed more efficiently than those using flat HTML.

In addition, developers are increasingly exploiting the possibilities of downloadable executables, such as Java applets and ActiveX Controls, and animation plug-ins, such as Macromedia, Inc.'s Shockwave. Making these elements play together at the browser is the work of standard scripting languages such as ECMAScript, JavaScript and JScript, and proprietary scripts such as Microsoft's VBScript and Netscape's LiveWire. Among other things, client-side scripts let browsers check the validity of data users key in forms before submitting the data to remote servers.

Keep in mind, however, that jazzing is the strategy under which Web applications most often lose their cross-platform functionality, since guaranteeing that all browser/clients have the same configuration is near impossible. For example, Microsoft's ASP templates only display and execute fully inside Internet Explorer 4.0. A developer may, however, configure the templates to serve equivalent (but possibly less sophisticated) Java applets to browsers that don't support ActiveX.

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Unfortunately, today's browser wars have created an environment in which Microsoft and Netscape offer equivalent but subtly divergent Web client functionality in many areas. In addition, the plethora of (often free) downloadable, third-party plug-ins means that almost every browser in existence is a "roll your own" affair.

If you haven't defined or aren't enforcing intranet client standards, you'll be shooting at a moving target. Developing applications that depend only on those functions, formats and APIs supported in the current versions of the most prevalent browser/client environments on your intranet may limit usage.

Internet Explorer 4.0 and Communicator 4.0 principally differ on many Web page formatting and tagging standards as well as on run-time environment, scripting language and security standards. In addition, they diverge on style sheet, multimedia format, object technology, push channel definition and software distribution package standards (see list, page 17).

You've got to tread carefully into development tools that promise you all these bells and whistles. Otherwise, you might be rigging your applications to favor one browser vendor over another.

BREAKING DOWN APPLICATIONS

Under the component approach, developers have the ability to transform any or all three tiers into containers for reusable objects, or components. In the client tier, components take the form of downloadable applets. Elsewhere, you've got to install the appropriate virtual machine software to handle such components.

At the Web server level, a persistent Java object is called a servlet. Such an object provides the ability to extend the server's core function set. It requires a server-side JVM to run.

JavaBeans is the leading component technology for Web applications. JavaBeans are reusable Java code modules that developers can integrate and compile into Java applications at any of the three tiers. EJB extends the JavaBeans component model to support server-side applications with security, online transaction processing, database-integration and other scalable enterprise functionality.

Run-time interactions between JavaBeans across all tiers are enabled through Java's Remote Method Invocation interface over the Java Remote Method Protocol or Internet Inter-ORB Protocol.

The number of visually oriented Web IDEs that support Java and JavaBeans technologies far outstrips those supporting development of ActiveX components. And while the World Wide Web Consortium only recently ratified EJB as an official recommendation, tool vendors are quickly moving to support this component model. EJB's real limiting factor will be the container environments, or EJB servers. Only WebLogic, Inc.'s Tengah Java application server offers an EJB container now, though other vendors promise they'll deliver similar functionality over the next six months, says Costa of Giga.

Costa ranks Symantec Corp.'s Visual Café 2.1 and Microsoft's Visual J++ as No. 1 and 2, respectively, in the Java IDE market. Inprise Corp., IBM and Sybase IDEs are in a dead heat for third place.

JavaBeans' ascendancy is all for the best because it focuses Web developers on a cohesive set of mainstream component specifications for cross-platform applications. It also has spawned a fast-growing market for third-party JavaBeans that can be integrated with any IDE. In fact, most JavaBeans IDEs come bundled with Beans from the IDE vendor and at least one outside Bean supplier.

JavaBeans IDEs also generally let users import new Beans from other sources or build their own Beans. Most IDEs provide visual, drag-and-drop palettes and wizards for laying, linking and customizing Beans and associated business logic. These tools let you build complex, ready-to-run applications with almost no original code.

However, JavaBeans is no panacea for the cross-platform incompatibility blues and may, if you're not careful, worsen the situation. There are three reasons why.

First, different JavaBeans IDEs may incorporate different versions of Sun's JDK or may not fully implement the Java classes, methods, properties and event models contained within the JDK.

Second, different client and server environments often support different JavaBeans containers, the run-time Java envi-

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Circle Reader Service #7

ronments consisting of JVMs, JIT compilers and Java foundation classes. These containers also provide basic, platform-integrated system services for executing JavaBeans. These services include threading, transactions, state management and resource sharing. System vendors have the flexibility to implement these features in various ways, so long as they conform to basic Java interface specifications.

Third, you may find JVMs (which interpret code prior to execution) and JIT compilers (which compile code on the fly at run-time) too slow for your JavaBeans application. This may spur you to compile your JavaBeans to the target hardware or operating system platform. Once you've done that, the code cannot, by definition, run on another platform without modification — in other words, without recompilation.

The risk is that JavaBeans applications or applets developed in one IDE may not display or execute properly in all run-time platforms. The only way you can know for sure is to test your applications fully in all target containers for the relevant tiers.

For JavaBeans developed to run in the client tier, you want at least to test in the latest versions of Internet Explorer and Communicator. For Beans designed for Web application servers, test under whatever servers are running on your intranet. For database server Beans, make sure to test with the containers developed by your enterprise relational DBMS vendors.

Only when you've tested your JavaBeans and have shown them to execute the same in all equivalent environments will you have true cross-platform portability of application components. Carefully consider a JavaBeans IDE's debugging features — especially debugging of Beans in various client and server environments. You'll live and die by them.

Still, JavaBeans is not the only component technology.

To the extent you already have ActiveX components installed at various intranet tiers, you'll have to concern yourself with bridging JavaBeans to those components via the Common Object Request Broker Architecture or some other object protocol. We'll continue to have to deal with JavaBeans-to-ActiveX integration issues for the indefinite future, considering ActiveX is the principal component technology for the world's dominant computing environment, Windows.

Developers have turned to ActiveX for distributing updates to applications running on Windows desktops. "Many applications that would have been deployed as Windows executables are now being deployed as ActiveX Controls that run in [Internet Explorer]," Costa explains. Just about every tool that can develop for Windows supports ActiveX, Costa adds.

PUSHING APP DEVELOPMENT

Web application development is a glorious but crazy quilt of glitzy, new technologies competing for our caffeine-addled, easily distracted mind share. As we've learned repeatedly in computing's first half-century, technical incompatibilities are the price we pay for vigorous competition in the development of a new, distributed, heterogeneous environment.

Java and HTML are the twin pillars upon which the Web's cross-platform hopes rest. Obviously, these standards have not eliminated vendor-proprietary development APIs, formats and technologies. However, owing to their universal acceptance, they have made it possible for intrepid, dogged software developers to cobble together more-than-rudimentary Web applications that play the same in most clients environments and that can be ported to various Web servers.

Truly write once, run anywhere Web applications will only be feasible if two big things happen: the Java industry shakes out into a single, rigorously standardized community, and Microsoft scraps ActiveX, COM and DCOM and rearchitects Windows around Java and its component technologies.

Neither of these will likely happen any time soon, but don't let that stop you from trying to scale the cross-platform application mountain with available Web tools and technologies. You'll be surprised at what you can accomplish. ●

Kobielus is a senior telecom analyst with LCC International, Inc., a network consulting firm McLean, Va. He can be reached at Kobielus_James@lccinc.com.

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Circle Reader Service #6

PROFILE INTRANET

An in-depth look at a corporate Web

Big value intranet on the cheap

THE INTRANET TEAM AT MARKETING SERVICES AND FRANCHISE GIANT CENDANT RELIES ON FREEWARE, SHAREWARE AND TOUGH NEGOTIATIONS WITH SOFTWARE VENDORS TO KEEP DEVELOPMENT COSTS DOWN AND BUSINESS WORTH HIGH. BY BETH SCHULTZ

INTRANET DEVELOPERS at Cendant pride themselves on building a sophisticated intranet on a shoestring. Team members are (from left): Scott Chin, Michael Bodetti, Roisin Black, Joanne Lin and Brendan Fedigan.

KENNETH GABRIELSEN

When it comes time to evaluate an intranet project at Cendant Corp., determining whether the undertaking will yield a good return on investment (ROI) better be the last thing on a business manager's mind.

The intranet team shuns the idea of elaborate ROI justifications. "If it isn't obvious that we are saving significant amounts of money, then we shouldn't do the project," says Scott Chin, intranet project manager at Cendant, a consumer and business services company in Stamford, Conn.

And when Chin says savings, he's talking cash. "We never quote soft dollars — they're too hard to measure and they show no value," he says.

So when the intranet team tallies the savings associated with putting a report online rather than distributing print copies, for example, it does so based on the cost of the paper and the toner alone — not on any nebulous projections for productivity gains or whatnot. Chin expects the company to save $250,000 in paper costs this year because he has started posting sales reports, culled from data stored on a mainframe, on the intranet.

More impressive is the $2 million or more Cendant expects to save annually because the intranet team has put a phone service bill- and credit-tracking application on the company Web. Or the $300,000 the company should save this year because of a new advertising extranet.

The AdLink extranet lets advertising and product managers review and approve ad materials for clients, and it provides a way to get ad mechanicals to clients quickly for their approval. Cendant ad managers post mechanicals on an extranet site, then notify clients that a job awaits approval. Clients log on to the secure site, then download Portable Document Format files for viewing.

Chin attributes the savings, which he expects to increase by 50% in 1999, to the elimination of mailing, shipping and fax costs. He's also factored in the wages of temporary workers Cendant no longer needs because of AdLink.

As word gets out about savings such as these, the intranet team finds itself inundated with project requests. While he appreciates the excitement surrounding the intranet, Chin says he often needs to temper people's enthusiasm. "I want to dispel the idea that it's easy to do an intranet application and to make people understand that it actually takes some development and could require security."

FUSION
Go online for more information on Cendant's intranet. DocFinder: 7704

Before the intranet team will consider a project, Chin makes sure the business manager has a clear set of requirements. "People think the intranet can solve everything, and make toast, too," he says.

The application also has to have a small technology footprint, Chin says. For example, the intranet team wouldn't undertake a project that requires support for a proprietary groupware program and four different Web browsers. Keeping a small technology footprint doesn't mean limiting product choices. "We use freeware, shareware and vendor negotiations to obtain and implement technologies that are leading edge," Chin says.

In doing so, the intranet team has built a high-value, self-funded corporate Web without spending much money. "Most of the projects I run cost less than $3,000," Chin says.

For the most part, Chin encourages use of Microsoft Corp. software, such as FrontPage for authoring, Internet Explorer for browsing, Access for prototyping applications and SQL Server for departmental databases. He provides policies and guidelines, but doesn't "force anything down people's throats." However, he adds, the intranet team won't support products to which it hasn't committed.

Chin breaks away from the Microsoft lineup only if another vendor offers something that Microsoft does not or will never provide. Two such examples are the intranet team's use of Forest Computer, Inc.'s Legacy Press software to deliver host reports and Net-It Software Corp.'s Net-It Central Server and Net-It Now client for easy content publishing.

Cendant's intranet manager chose the user-friendly Net-It and FrontPage because approximately 100 business managers across the company are the ones filling the intranet with basic content. The intranet team provides advice on what type of information departments should publish, but leaves the actual postings to the managers — it's too busy developing intranet applications.

Chin makes an interesting distinction between intranet content and applications. "Content is really where you get a bang for your buck. Applications bring the technological business advantage."

The potentials are plentiful, says Michael Bodetti, vice president of telecommunications and desktop technologies. "We've got to pick and choose which [applications] make the most sense."

At times, augmenting a business process by attaching a little piece of the Web fits that bill. Other times, creating new business processes for the intranet is more logical. But then again, using the intranet to change — that is, improve — a business process often makes the most sense, Bodetti says.

The latter is the priority, maybe because identifying business processes in need of improvement isn't too tough. "We're an extremely fast-paced company, so a lot of business people haven't taken the opportunity to figure out how things can be done better. The intranet lets us do that for them," Bodetti says.

The intranet team, for example, now posts online phone reports generated by the company's automatic call distributor and PBX systems. Department managers still must view and report on phone use, but they can do so by pointing and clicking their way through a few screens rather than wading through reams of paper to find the bill portions for which they're responsible.

By the same token, a call-data-records (CDR) intranet application makes it much easier for business managers to reconcile their records for outbound phone calls against the formal CDR or to approve the records. A process that used to require a few days to collect, sort and deliver reports can now be done simply by posting all the data online. Business managers can query phone numbers by entering the extension number and a date range.

The intranet team sends out an e-mail tickler reminding business managers that it's time to check the CDR. The message includes a URL link to the page with the information.

The team has its share of experience augmenting existing procedures and creating new ones, too.

The intranet, for example, has made it possible to create a central clearinghouse for client information. A sales manager can go to the "Client Info" site to find contact information and read up on the status of relationships a client has with other parts of the sprawling Cendant organization. "Our managers . . . can quickly find out the if the client is hot, warm or cool on our services," Chin explains.

The intranet also sits behind www.netmarket.com, the Internet site Cendant launched last summer. If you sign up for a NetMarket membership, you can buy everything from automobiles to frozen peas from the site. Cendant estimates the number of transactions handled on this site at 60,000 per month, for a yearly revenue of $1 billion.

Browser-wielding NetMarket representatives manage the Internet site. They handle membership requests and place orders from an intranet application that ties into a variety of host systems.

NetMarket perhaps epitomizes all of Cendant's future business applications. Cendant's chief information officer wants all production processes accessible via a browser, so developers front-end any new application with the Web. The Big Iron, though, keeps pumping away in the background.

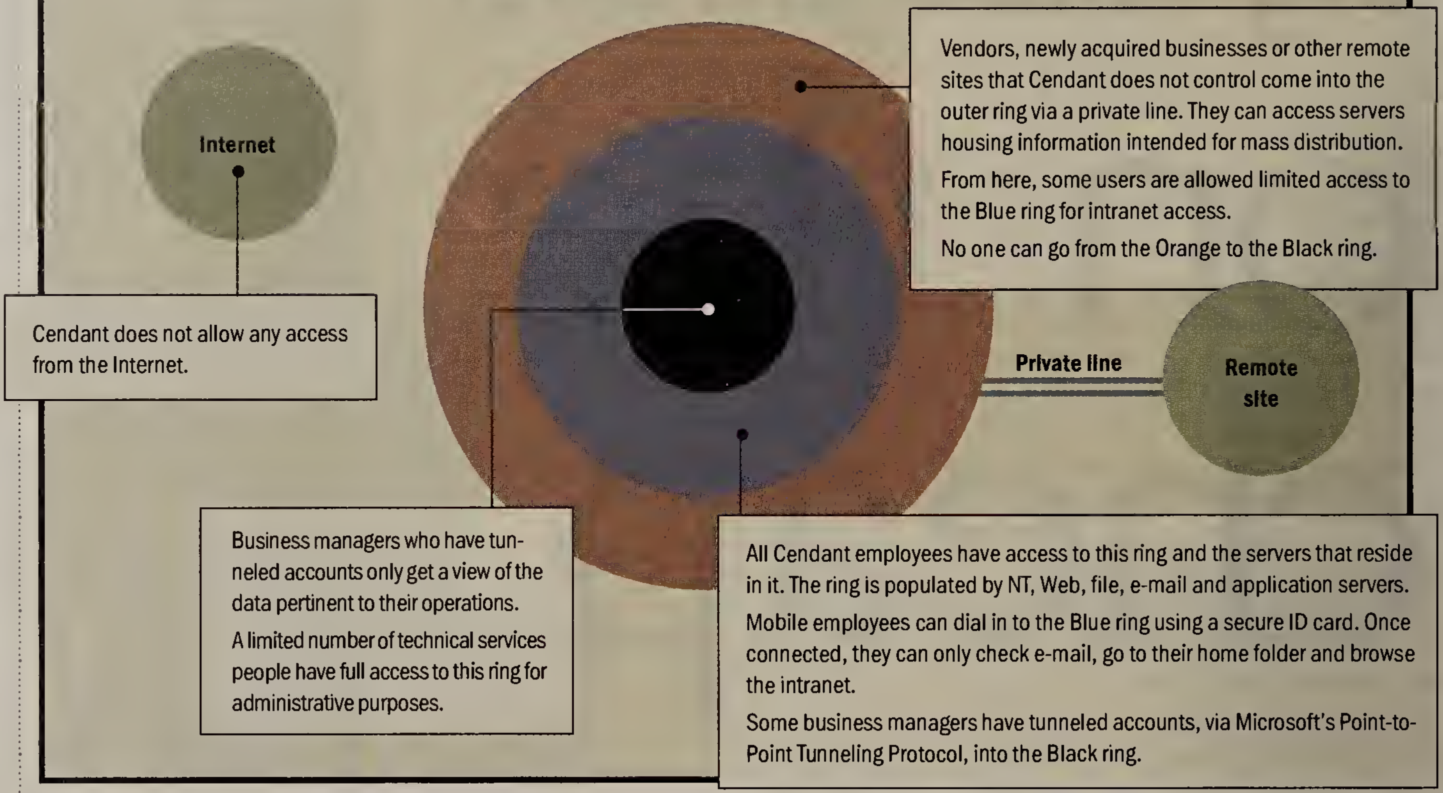
"We will continue using legacy systems for their sheer processing power, but the GUI of choice is the Web," says Chin, noting that by the year 2000 the Web interface will have infiltrated into middle-tier servers as well and will open a whole slew of potential intranet applications.

Chin and his team, no doubt, will use the same common sense to evaluate those opportunities. "If we have to dig to find an ROI," Chin stresses, "then we aren't working on the right project." •

CENDANT SECURED

Given the nature of its business, Cendant holds millions of credit card numbers and other sensitive customer and vendor information in myriad corporate databases. That makes security of utmost concern.

To ensure private information stays that way, the company has built a security architecture of concentric rings. In addition to firewalls, access attempts pass through a variety of security checks before being granted. They include: source IP, NT Security and Unix Secure Shell.



Vendors, newly acquired businesses or other remote sites that Cendant does not control come into the outer ring via a private line. They can access servers housing information intended for mass distribution.

From here, some users are allowed limited access to the Blue ring for intranet access.

No one can go from the Orange to the Black ring.

Cendant does not allow any access from the Internet.

Business managers who have tunneled accounts only get a view of the data pertinent to their operations.

A limited number of technical services people have full access to this ring for administrative purposes.

All Cendant employees have access to this ring and the servers that reside in it. The ring is populated by NT, Web, file, e-mail and application servers.

Mobile employees can dial in to the Blue ring using a secure ID card. Once connected, they can only check e-mail, go to their home folder and browse the intranet.

Some business managers have tunneled accounts, via Microsoft's Point-to-Point Tunneling Protocol, into the Black ring.

What is Cendant?

Cendant Corp. is a new name on the world market, but many of its businesses are long familiar — Avis, Century 21, Howard Johnson, Ramada and Shoppers Advantage, to mention a few.

Cendant emerged from last year's merger of CUC International, Inc., a leading membership-based consumer services company, and Hospitality Franchise Systems, Inc., the largest franchisor of overnight lodgings. The combination makes Cendant, of Stamford, Conn., the world's largest consumer and business services company.

Cendant, with its name rooted in the Latin word "ascendant," operates principally in three market segments: membership services, travel and real estate. It also has a "high-growth" portfolio, which includes a mutual fund company, Jackson Hewitt tax service and a variety of entertainment and educational software makers.

For the year ended Dec. 31, 1997, Cendant posted revenues of $5.3 billion and net income of $872 million. However, the company may have to restate these and subsequent financials given recently discovered accounting irregularities at some former CUC business units.

Top company executives promise an aggressive investigation of the problems and assert that Cendant remains "strong and vibrant."

THE CENDANT INTRANET

Cendant's Web dates to September 1996, when a CIO-backed IT group created an intranet shell and presented it to senior executives. Management quickly approved the intranet plan and the hiring of a dedicated intranet project manager.

GOAL

Use common sense to build a high-value intranet at low cost.

INTRANET DEVELOPERS

A small core team, virtual teams for larger projects, and college interns who help build the infrastructure and educate users.

NUMBER OF USERS

Approximately 1,000 to 1,500 line of business managers and executives on the East Coast; 500 to 1,000 additional users gain access as each remote site goes online.

WEB SOFTWARE

Microsoft's Internet Information Server, Netscape's SuiteSpot and The Apache Group's Apache Web Server; Microsoft's Internet Explorer and Netscape's Navigator; PointCast's I-Server push software; Forest Computer's Legacy Press Web-to-host software.

AUTHORING AND APPLICATION DEVELOPMENT TOOLS

Microsoft's FrontPage 97 and 98 and Net-It's Net-It Central Server and Net-It Now client for content providers; Microsoft's Visual InterDev and Visual Basic; JavaScript; Java; VBScript; Perl; AWK; SED; WSH for developers.

DATABASE SOFTWARE

Microsoft's SQL Server for departmental databases and Access for application development; Oracle database servers for Big Iron applications.

INTRAVERT

Intranet information as a spiritual experience

BY MARK GIBBS

Greetings, my children. I have just been ordained. No, really, would I lie about such a matter? Just go to www.ulc.net and you, too, can be ordained.

Now I feel compelled to act like a man of the cloth. So I'll sermonize on the wholly useful intranet trinity: reusability, content and business.

In the software development world, the concept of reusable code has become a Holy Grail. In its JavaBeans component architecture, Sun Microsystems achieves modular reusability through objects, written in Java, that have highly structured interfaces. The way an object communicates its functions and relationships to other objects is so well structured that a number of vendors besides Sun offer tools that allow developers to build programs graphically. They create applications by dragging objects, called Beans, onto a virtual work surface and by linking inputs and outputs.

CHRISTOPH HITZ

Microsoft offers much the same procedure for its ActiveX technology. Although, sinner that the company is, Microsoft insists ActiveX is as secure as Java when it patently isn't. Bill, for your penance, say 1,024 Hail McNealy's.

Object technology is a huge boon for IT groups building intranet applications, whether they are using Web server APIs, servlets on the back end or applets on the front end. It makes it much easier to tweak code — part of the inevitable iterative development of programs.

To make reusability really pay off, you need to extend this concept to intranet content. Part of the strategy for doing so involves the use of templates to achieve the same look and feel across pages, and part of it is in setting and enforcing a content development process.

But this only addresses the control of appearance. What we really need is reusable information. Let me stress that reusable data is not as useful as reusable information. For example, the data about 1997 month-by-month sales is generally much less useful after the fact than an analysis of trends and factors that generated those sales.

To create information, you need to provide structure to your data. The only workable technology for doing so is the World Wide Web Consortium's Extensible Markup Language (XML) standard. XML lets you embed structure in data.

When you extract data from a legacy database through a Web server, you typically lose the context of the data as far as applications are concerned. In our 1997 sales report, for example, the Western Region's June sales figures would be in the middle of a table. It's tricky to translate that information into a form so that it is readable by another application.

But XML retains the context of data. This lets applications receive data with its meaning intact.

For example, let's say that I'm searching a legacy database for customers who have spent more than $100,000 in the past year. A Web server typically delivers the results of this query as a tabular display. If you trap this output and feed it into a spreadsheet, you have to rely on the consistent placement of data fields as defined by lines, tabs and spaces. But one minor change in layout format and the transfer fails. Worse still, such a fragile environment — a veritable devil's playground — more or less guarantees that you'll have problems.

But with XML, you wrap each record and field in custom tags that define the data's structure and content. In my example, you'd tag each record as something like <customer> . . . </customer> and within that record, tag each customer name, for example, Fred Smith, as <cust_name>Fred Smith</cust_name>. The data is implicitly reusable. Talk about heaven!

To make sure users create documents with XML, provide templates for standard documents types and mandate their use. Teach users who are creating documents on an ad hoc basis how to add XML markup and explain why it's desirable.

However, XML will only be of limited value if you don't understand the data with which your company actually works. So you'll need to survey the kind of data that comes in and goes out and create appropriate templates. In the process, you'll be doing something that IT groups rarely do: examining the details of business operations.

By building content using XML, planning for reusability and providing users with appropriate authoring techniques, you'll get the best possible bang for your buck from your intranet investment.

So here endeth my sermon.

May your god go with you.

Besides acting as editorial advisor for Intranet, *Gibbs does weddings, funerals and network exorcisms. You can reach him at imcolumn@gibbs.com.*

Don't put form before function

BY STEVE BLASS

Please step in and lie down, the doctor is in for consultations. As a network architect at Houston-based Sprint Paranet, Blass understands the strain of people who are developing and managing intranets. Send him your problems at dr.intranet@paranet.com.

I want to make our linear intranet more exciting, in part by giving users more control over navigation. What navigational elements are the most effective?

It's tempting to use at least one or two of every navigation feature available just because that makes producing Web pages fun, but you may drive your users nuts. What you really need to do is scrutinize your Web server log files and build a system that reflects user preferences.

For example, if everyone starts at the home page and clicks five times to get to the search engine page, you ought to supplement the first page with a search engine link, be it a button, hypertext or a hot portion of an image map.

ASK DR. INTRANET

I advise providing redundant options by using hypertext and image map graphic links. Pop-up windows, menus and checklists are good choices for presenting reasonably short lists. It doesn't make sense to me, for example, to use a pop-up list of 50 state abbreviations. It's easier to type in the two letters than to scroll the list.

The idea is, don't get wrapped up in form over function. Many Web page designers include site maps because the publishing software makes it easy, for example, but few site maps make sense. Or providing a table of contents in one frame and a text window in another can make navigating large documents much easier. Unfortunately, not all browsers support frames, so you lose the weak or provide a frameless version of your pages.

Can you recommend a good intranet-in-a-box package?

From the Internet Business Group mailing list (Subscribe at ibglist@silcom.com.)

A number of products are available in this category, although the trade name Intranet-In-A-Box belongs to CompuServe/AOL. Your choice will depend on whether you're running Unix or Windows NT, how large you're going to need to scale the system and whether you're organizing at a project, departmental or company level. Finding the right tool means thinking through the goals and objectives you want the technology to meet and reviewing the tools with that end in mind.

Go to www.nwfusion.com and type in DocFinder No. 7701 for links to some intranet-in-a-box packages.

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Circle Reader Service #4

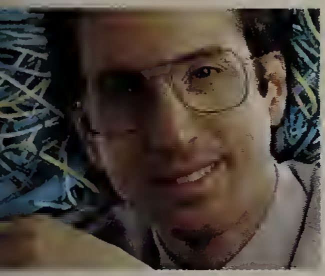
EYE ON THE CARRIERS

The polarized E-rate debate

By now you probably realize your bills for carrier services are up because carriers are passing along the government's Internet-in-the-classroom subsidy fee.

Who's to blame — the carriers or the Federal Communications Commission? As usual, each of the official policy shapers has decided it's either all one side's fault or all the other's.

Some user groups have lectured the FCC that it fouled up the E-rate school program and have demanded that the FCC stop collections until it further lowers long-distance carriers' access rates. But that's a page out of AT&T and MCI's lobbying playbook; most users' initial instinct has been to blame the carriers.



David Rohde

By contrast, the Communications Managers Association has posted a useful letter on its Web site (www.cma.org) telling the FCC to punish carriers for imposing excessive E-rate surcharges. But isn't it possible the FCC is partly to blame for assuming the carriers would lie still for this extra cost?

Before you decide this fiasco is one party's fault, keep some things in mind:

1. Historically, the federal government has had little or nothing to do with funding education, notwithstanding the creation of the U.S. Department of Education in the 1970s. This kind of scheme ought to meet a pretty strict justification test.

2. The E-rate program is not just about teaching kids computer skills. The original premise was that online access improves learning in all subjects — English, history and foreign languages as well as math and computer science. All Internet hype aside, the evidence on that so far is pretty inconclusive.

3. Some have argued that E-rate would be more effective if it mandated that schools teach kids specific applications instead of generic computer ability. I think this misses the point of education. Telling students they have to master Microsoft Exchange is like telling them they not only have to take music, but specifically they have to learn to play the viola. Did you learn your current job in high school?

4. Even E-rate supporters agree the program has been marred by confusion over whether things like hubs, routers, support services and administrative WAN links count toward the subsidy. Here, once again, the FCC has entered the computer field with blinders on about the reality of installing and supporting networks. The FCC is what's known in Washington as an "expert agency." If that is so, it's high time for the commissioners and staff to get out of their bar association meetings and attend a few educational sessions at ComNet or Interop.

5. E-rate is supposed to equalize the chances of rich and poor schools to obtain robust Internet access. But isn't lowering the cost for everybody the best way to ensure this? The computer industry has done some of that with its new, less expensive PCs. The telecom industry, alas, has not. E-rate is exactly the kind of thing that refocuses carrier attention away from bringing down the cost of bandwidth and back toward regulation and politics. And as we now know, that seems to raise everyone's cost, not lower it.

Rohde is Network World*'s senior editor of Carriers & ISPs. He can be reached at david_rohde@nww.com.*

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SPECIAL FOCUS

Telecom evolution

The long road to long distance

Local phone companies want to be long-haul carriers, but regulations stand in the way.

By Tim Greene

The day Congress passed the telecom reform act, the nation's biggest local phone companies swore they would be selling long distance within a year.

That was more than two years ago.

In the meantime, the regional Bell operating companies have been trying unsuccessfully to prove themselves worthy of the prize they seek: the right to compete for the billions of dollars customers spend each year on long-haul phone services within RBOC territories.

That leaves major corporate phone service buyers cooling their heels, waiting for the convenience and economy of buying all their WAN voice and data services from one vendor.

The big attraction long distance holds for RBOCs is simple: lots of money. Bell Atlantic Corp., for example, covering the region from Maine to Virginia, stands to gain a share of a $24 billion in-region long-distance voice market and a $4 billion long-distance data market. "We wake up every day thinking about those kinds of big numbers," says Al Binford, president and CEO of Bell Atlantic Long Distance, Inc. While the numbers are not as big, corporate customers hope to save money if RBOCs get into the long-distance market. An RBOC should help trim prices just by adding one more long-distance competitor.

"We need that. I sat in on a briefing with [long-distance carrier] MCI Communications Corp. where they were trying to sell us local service. I think it would be a good thing if Bell Atlantic tried to sell us long distance, too," says a telecom project manager for a major East Coast financial institution who asked not to be identified.

Pump up the volume

If a corporation buys local and long distance from a single carrier, the carrier will be more likely to offer higher overall discounts based on the increased volume. "It gives you a better negotiation tool," the telecom project manager says.

More carriers means more choices, so customers looking for redundant long-haul connections will have more carriers to pick from, he says.

Despite the interest, the wait for RBOC long distance will continue for awhile. Legal hassles between the RBOCs and regulators, as well as RBOC challenges of the Telecommunications Act of 1996, have slowed things down. The RBOCs say the earliest they will be able to offer in-region long-distance service is later this year. More likely, some say, it will be 1999. The delay stems from the fact that it is difficult to move RBOCs away from their positions as the monopoly owners of the local phone services market.

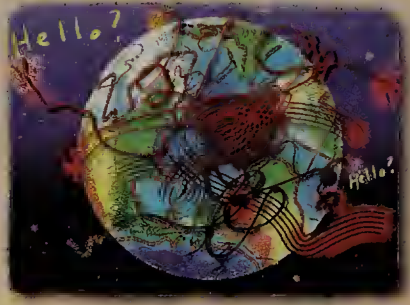
When U.S. District Judge Harold Greene broke up AT&T in 1984, he granted RBOCs exclusive rights to sell local phone service, but specifically denied them the chance to sell long distance.

The telecom act changed all that, at least on paper. The act says RBOCs can sell long distance if they open their local markets to competition.

LONG-DISTANCE BLUES

Why can't you buy long distance from RBOCs? RBOCs say they would sell long distance but:

- ● So far no RBOC has been able to meet a 14-point checklist set by the FCC. Among other items, the checklist requires an RBOC to prove it has cleared the way for local phone competition.
- ● AT&T and MCI have opposed all RBOCs' long-distance applications. Their opposition has hindered the process, experts say.
- ● Many RBOCs do not have adequate electronic ordering systems in place so new local competitors can swap data about customers who want to change carriers.
- ● RBOCs are waiting for a court decision that spells out whether they have to sell packages of services to CLECs at wholesale.
- ● RBOCs are also waiting for a court decision on whether the telecom act unconstitutionally discriminates against RBOCs.


Hello?
Hello!

But before an RBOC can sell long distance, state regulators and the Federal Communications Commission must agree that the RBOC fulfills a 14-point, pro-competition checklist. Several states have given their OKs to the local RBOCs, but in each case, a stricter FCC has denied permission.

RBOCs are also waiting for federal courts to make two key decisions. One will determine whether barring RBOCs from long distance is constitutional. If it isn't, the burden of the checklist will be lifted. The other judgement will decide how much work RBOCs must do to help their competitors piece together networks. Today, RBOCs must sell piece-parts of their network, such as local loops and switching services, to competitive local exchange carriers. But the RBOCs argue they don't have to bundle local loops and switching together, for example, at a price that is less than what they cost individually.

While decisions on both matters are not expected until late this year, RBOCs are moving ahead with other plans.

Ameritech Corp. has been selling cellular long distance since February 1996 when Congress passed the telecom act. And Ameritech has launched a marketing deal with long-distance carrier Qwest Communications to package long distance and local phone service.

US WEST Long Distance, Inc. set up a similar arrangement with Qwest but the deal has since been blocked by a court injunction. The package was popular: US WEST sold the Qwest service to 130,000 customers in three weeks before being blocked, according to Kathy Stephens, vice president of business planning for US WEST Long Distance.

RBOCs are not restricted from selling long distance outside their regions, but none has tried to do so on a wide-scale basis. That is because RBOCs expect their current customers to be the ones who buy long distance from them, not someone in another part of the country who is unfamiliar with the RBOC's name.

Trials

However, some RBOCs have run trials outside their regions to fine-tune their long-distance marketing and operations skills so when they are ready to sell a service in earnest, they will be prepared.

"It's like a Broadway play," Bell Atlantic's Binford says. "You open out of town — off Broadway."

Bell Atlantic has also committed to building a long-distance backbone that handles data and voice. Binford says Bell Atlantic hopes to get approval to sell long-distance data services before it gets permission to sell long-distance voice. That idea is based on a request Bell Atlantic made to the FCC asking the government body to consider Bell Atlantic's voice/data backbone an "advanced data network." An advanced data network is the type of network that the telecom act specifically states should be encouraged.

According to sources, one RBOC considered announcing plans to sell long-distance voice services that would travel over a data network as data packets. The argument would have been that the service was data, not voice, and therefore was not subject to telecom reform act restrictions. ■

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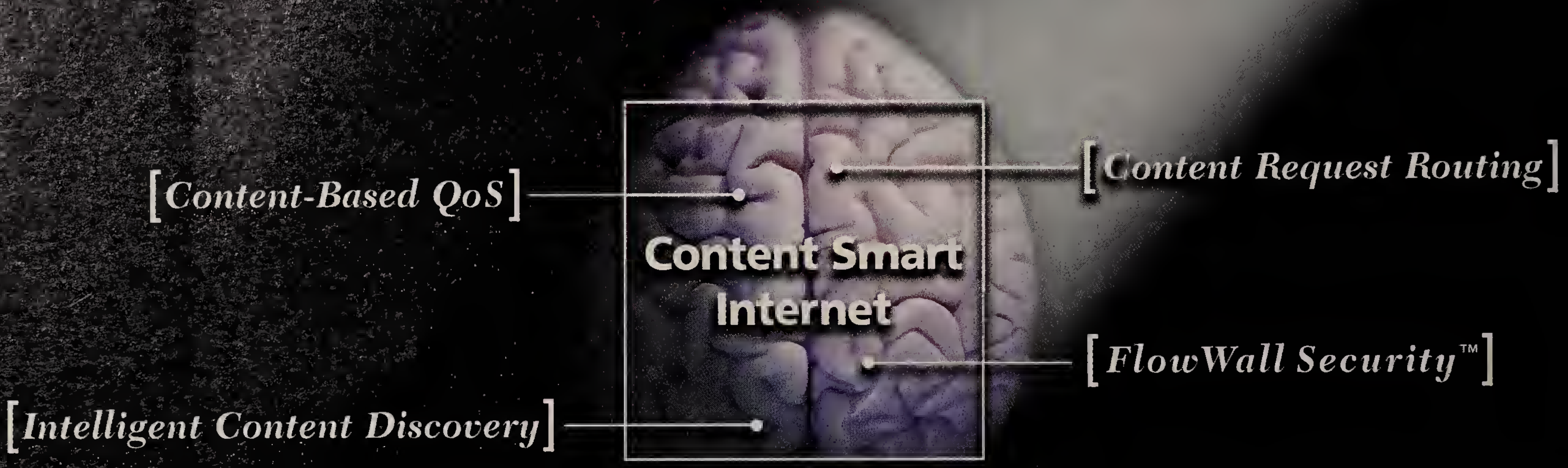

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Briefs

■ *Rockville, Md.-based* **SecureWin Technologies, Inc.** *announced the shipment of* **SecureWin 2.0, NT security software** *that provides local file and e-mail encryption, single sign-on and a way to administer security policy controls. The SecureWin client software costs $49.95 per seat. The SecureWin server component is available for Microsoft's Small Business Server at a cost of $500; as an Enterprise Server for $30,000 for use with up to 100 NT 4.0 servers; or as a Single Domain Server, priced at $3,000.*

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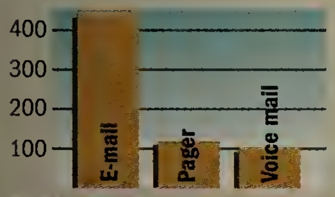
When asked which medium they were most likely to respond to first, 659 IT professionals said:



SOURCE: MILLER FREEMAN INC.'S PC EXPO

■ *Electronic commerce start-up* **EC Cubed** *announced a suite of* **six Java-based electronic commerce applications** *that can be mixed and matched as components to build business-to-business trading and inventory management. The components, ranging in price from $16,995 to $64,995, let corporations set up a workflow process for order approval, a way to accept and respond to bid submissions, and customer management applications for maintenance, repair and operations.*

© EC Cubed: (203) 761-3900

■ *Last week* **Cisco Systems, Inc.** *announced IP/TV 2.0 — a package that transmits* **TV-quality video over Enterprise IP networks to PCs.**

Available next month, IP/TV 2.0 runs on Windows 95 and NT. A starter pack with 20 clients and one server package sells for $6,500.

In-Site

Two million Costa Ricans get secure ID cards

By Ellen Messmer
San Jose, Costa Rica

In Costa Rica, a voter registration card not only lets you vote — it's also a citizen's ID card needed for government benefits, to get a driver's license and passport and as proof of identity for cashing checks.

But today's Costa Rican paper-based ID, with its glued-on photo and signature, is easy to tamper with, making it too simple to get away with fraud.

So the government of Costa Rica this summer is embarking on a modernization effort that calls for issuing two million citizens a new type of plastic ID card that uses biometric security technology to store digital fingerprints.

"For the year 2002, when we have the next election, we'll have the new ID card to check the person's identity," said Fernando Viquez, planning director for the Costa Rican election tribunal, the Tribunal Supremo de Elecciones. Under Costa Rican law, all adults have to be registered to vote.

Viquez *pledges rollout by the year 2002.*

The conversion process from old to new will be a mammoth task, and the Costa Rican government has hired Unisys Corp., under a $5 million systems integration contract, to provide the hardware and services — with the software's graphical user interface and documentation all in Spanish.

Tens of thousands of Costa Ricans will be paying a visit to any of 28 different vote/registration offices across the country to have two, and only two, fingerprints captured by fingerprint readers and a search/match system from Identficator Corp.

The citizen's signature will then also be captured using Inforite, Inc. signature pads. Next, the citizen's photo will be taken using an Hitachi, Inc. video camera and stored in a Hewlett-Packard Co. optical image jukebox. The fingerprint, signature and photo will all be stored on a Datacard Corp. biometric identification card. Bar-code readers, such as those from Symbol Technologies, Inc., can read the information and view the fingerprints stored on the card.

After completing this high-tech ID procedure, the Costa Rican citizen may not immediately get his new ID card.

First, government personnel, working with Unisys, will have to compare the citizen's stored fingerprints through an online search of the government's entire fingerprint database of previously enrolled applicants to ensure there are no duplicates.

In addition, if the applicant already has a paper-based ID card, the election-registration personnel will check the new digital photo with the old photo.

Because the fingerprint data is being continuously uploaded and downloaded from an existing Unisys mainframe located here, the project will require high-band-

See **Costa Rica,** ***page 58***

SilverStream unwraps Java apps server

By Chris Nerney
Burlington, Mass.

A year ago this month, SilverStream Software, Inc. made a debut that was the envy of others in the crowded Web application server market.

SilverStream had an experienced management team — a group of former PowerSoft Corp. veterans led by CEO David Litwack — $23 million in financing and a major partnership with Intel Corp.

All this landed SilverStream on the short list of companies to watch, despite not having a commercial release out until December.

The release of SilverStream 1.0, however, validated the hype, according to many developers and analysts who praised the Java-based application server and development tools package.

But accolades for SilverStream 1.0 were not unqualified, as some users questioned the software's scalability, performance and development environment.

The newest version of the company's server, SilverStream 2.0, is designed to eliminate the concerns of users who want to build and deploy large-scale Java applications for the enterprise.

Released in beta last week, SilverStream 2.0 includes a number of upgrades, most notably the addition of server load balancing and failover, and an object-oriented environment for using Java to develop HTML applications (see graphic).

"We had very good Java support in Version 1.0, but HTML wasn't easy to do," said David Dewan, SilverStream's vice president of product strategy.

Dewan said SilverStream 2.0's "dynamically generated HTML" allows programmers to develop HTML applications using objects, thus avoiding time-consuming HTML coding and Common Gateway Interface scripting.

"To do HTML in the way they're doing it is unique," said Craig Roth, an analyst at META Group, Inc. in Stamford, Conn. "People want to generate HTML from their Java, so this feature is a real plus."

Roth said SilverStream, while "solidly positioned in the market right now," has undertaken an ambitious agenda. "They're trying to be a one-stop [rapid application development] shop," he said. "But it will be a challenge to juggle everything they're trying to do."

One beta user who installed 2.0 earlier this month said it was too soon to render a verdict. "We're still a month or so away from really understanding capabilities and limitations," said Jefferson Rampy, a senior developer at Tivoli Systems, Inc. in Austin, Texas. Rampy did cite printing problems with 2.0, a common complaint about Java-based applications.

SilverStream 2.0 runs on Windows NT and Solaris platforms and can use any Java-capable browser. Pricing ranges from $495 for a single-developer package, including a single-seat server and development tools, to $8,500 per server with unlimited users.

Commercial release is scheduled to be available in the fall.

© SilverStream: (888) 823-9700

SilverStream upgrades apps server

The new version of SilverStream's Java-based applications server, now out in beta, includes several new features:

- **Server clustering, load balancing and automatic restart:** Addresses scalability, reliability issues.
- **Dynamic HTML:** Object-oriented, event-driven programming environment designed to avoid linear HTML coding, CGI scripting.
- **Business object designer:** Allows developers to encapsulate business logic into reusable objects to create multitier distributed applications.
- **CORBA support:** Enables access of business objects by non-SilverStream platforms.

*Source: Dataquest, A Gartner Group Company.
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*Circle Reader Service #***12**

Inktomi: Show me the money

New initial public offering, partnerships turn cache to cash.

By Andy Eddy
San Mateo, Calif.

There's a kids' T-shirt making the rounds through Silicon Valley that says, "My favorite letters are I, P and O" — and you'd be hard pressed to find anyone at Inktomi Corp. who'd disagree.

Inktomi had its initial public offering (IPO) of over 2 million shares on June 10, and the results were highly successful. The price per share was set before the IPO at $18, but by the close of the market that day the price had doubled to over $36. It had gotten as high as the mid-40s early last week.

The success of the IPO adds to Inktomi's already bursting press kit, which spotlights the many customers and partners it has for its two products: Traffic Server, network caching software to help with bandwidth management, and Inktomi Search Engine.

Indeed, much of the attention a company receives on the networking-industry playground has to do with who's on the other side of the see-saw. To its credit, Inktomi has had its share of big buddies who've asked it to come out and play. Among the deals Inktomi has announced are:

- A strategic alliance with Intel Corp. to collaborate on optimizing Traffic Server to run on Intel systems. The agreement also includes an equity investment by Intel.
- An agreement with Microsoft Corp. to use Inktomi's search software on Microsoft's online properties, including The Microsoft Network.
- An expansion of the company's sales efforts into Europe and Asia, leading to subsequent deals with corporations and ISPs to utilize Inktomi products.
- A deal with America Online, Inc. to employ Traffic Server to manage data flow across the online service's extensive Web offerings.
- Agreements with Snap! and Yahoo! Inc. that integrate Inktomi's search technology into the search results the companies provide to their respective users.

It's obvious that Inktomi has impressed key people with its core technologies. Sam Parker, vice president of product development at Snap!, a search and navigation service from CNET, Inc. and National Broadcasting Co., is using Inktomi's search results to supplement Snap!'s internal directory. If Snap!'s directory draws a blank, Inktomi's spider search technology kicks in transparently.

"It's difficult for users to know when to search with a directory and when to use a spider search to get what they want. By working with Inktomi, we're able to integrate both of those services," Parker stated.

Parker also noted that Inktomi is open to discussions on how the product can be improved for the benefit of both companies.

With its new cash reserve, Inktomi is positioned to aggressively pursue other business opportunities, such as funding more software research and development, acquisitions and further partnerships.

Ted Julian, an analyst with Forrester Research, Inc., a consultancy in Cambridge, Mass., thinks Inktomi "might use some of this money to broaden [its] reach beyond just the ISP kinds of companies. Should its businesses change or get more competitive, [Inktomi] might find that renewing a contract is hard in coming years."

Where Inktomi goes from here seems wide open, courtesy of IPO-replenished pockets and a file cabinet full of high-profile contracts. Robert Gray, research manager for storage systems at International Data Corp., a consulting firm in Framingham, Mass., strongly advised that Inktomi not sit back and relish these victories.

"The danger for Inktomi or any company that has a Wall Street success is they stop working hard. The market is going to continue to evolve, and there's going to be lots of competition, so there's hardly time to party," Gray said.

Due to Securities and Exchange Commission regulations, Inktomi is in the midst of a mandatory quiet period, and therefore couldn't comment on this article.

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PROFILE: INKTOMI CORP.

Founded:	February 1996
Headquarters:	San Mateo, Calif.
CEO/President:	David Peterschmidt
Financials:	Publicly owned, trading under NASDAQ as INKT; initial public offering on June 10
Principal products:	Inktomi Search Engine for Web-based search and Traffic Server for network caching

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Brightware fosters dialog with 'Net customers

Server software helps companies exploit Web, e-mail traffic.

By Paul McNamara
Novato, Calif.

When customers talk to your Web site, whether by browser or e-mail, your site had better hold up its end of the conversation.

Failure to do so results in unsatisfied site visitors and the potential for lost revenue, said executives at Brightware, Inc. of Novato, Calif. To combat the problem, the company this week will announce Brightware 2.0, customer interaction software that Brightware claimed will help users reap greater rewards from their Web site traffic and resultant e-mail.

"Dialog-based customer interaction has been missing from the 'Net model," said Chuck Williams, Brightware president and CEO. "[Web site visitors] are getting frustrated not being able to find what they are looking for; they need help."

Beta customers and industry analysts said they believe Brightware does have help to offer. Brightware 2.0 is server-based software that runs on Windows NT and consists of two separate agents.

Advice Agent utilizes Java servlets and works in conjunction with a Web server and back-end data repositories. The agent walks browser users through question-and-answer sessions designed to determine their needs and the host company's ability to meet those needs. Advice Agent also creates customer profiles for use with repeat visitors.

Answer Agent, previously called Inbound Marketing Agent, automatically answers customer questions submitted over the Web or via e-mail. Brightware contends that 80% of such inquiries can be handled by Answer Agent, with the remainder routed to human customer-service agents. The company also claims an eightfold speed increase in this upgrade over its first version.

Jack Rodgers, president of American Finance & Investment in Fort Lauderdale, Fla., said he is anxious to offer Advice Agent to the 25,000 weekly visitors who hit his company's Web site.

"We never remove the opportunity for human interaction," Rodgers said. "However, the more that customers can educate themselves and become ready to buy utilizing a Pentium processor rather than our human resources, the lower our cost of sales and the lower the price that we can deliver to the customer."

One industry analyst said Brightware 2.0 will find an audience among companies looking to get the most out of their Web storefronts.

"What you really don't know when you're running a Web site is what the opportunity cost is of poor customer service," said Chris Stevens, an electronic commerce research analyst for Boston-based Aberdeen Group, Inc. "There will be a space for Brightware for two reasons: No. 1, it's an area of enormous [customer] pain; and, No. 2, they have adopted a database strategy that is consistent with a lot of installed systems."

Brightware integrates with Oracle, Microsoft SQL Server, Sybase, DB2 and other databases that support the Open Database Connectivity standard. The Brightware Java servlet supports Microsoft's Internet Information Server, Netscape FastTrack and Enterprise servers, Lotus Domino Go Web Server and Apache Server.

Available immediately, Advice Agent and Answer Agent cost $190,000 each for a perpetual license, or $95,000 each per year. Customers buying both get the second at half price. Installation services take 12 weeks for Advice Agent and cost $75,000; eight weeks and $50,000 for Answer Agent. Maintenance contracts cost 18% per year.

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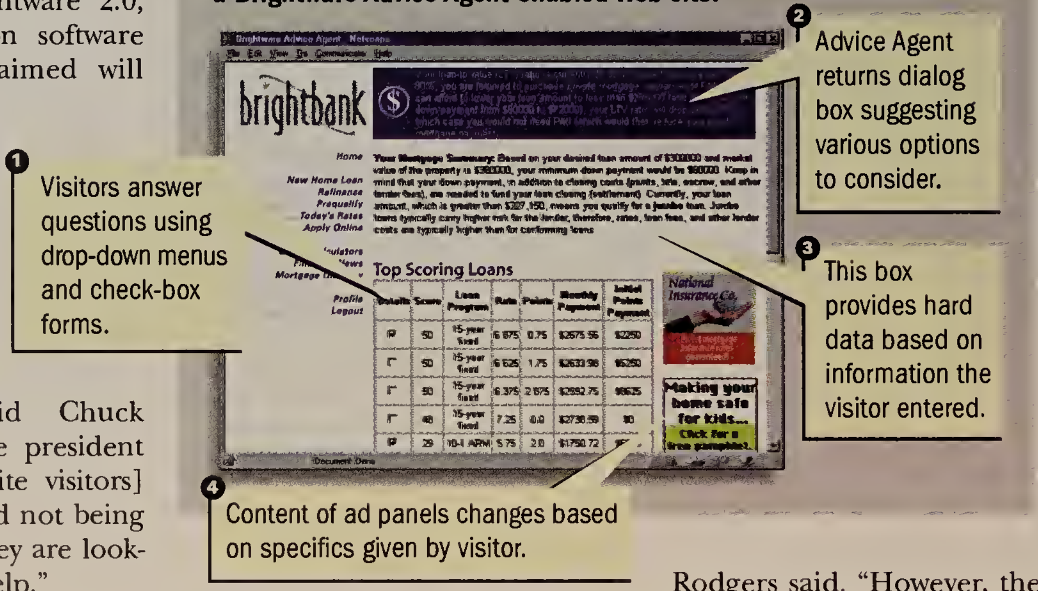
END USER'S VIEW OF BRIGHTWARE

Here's what online customers of a mythical bank see when hitting a Brightware Advice Agent-enabled Web site.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☐	50	15-year fixed	6.375	2.875	$2592.75	$8625
☐	48	15-year fixed	7.25	0.0	$2738.59	$0
☑	29	10-1 ARM	5.75	2.0	$1750.72	[illegible]

① Visitors answer questions using drop-down menus and check-box forms.

② Advice Agent returns dialog box suggesting various options to consider.

③ This box provides hard data based on information the visitor entered.

④ Content of ad panels changes based on specifics given by visitor.

Get more online:

- **A Brightware overview**
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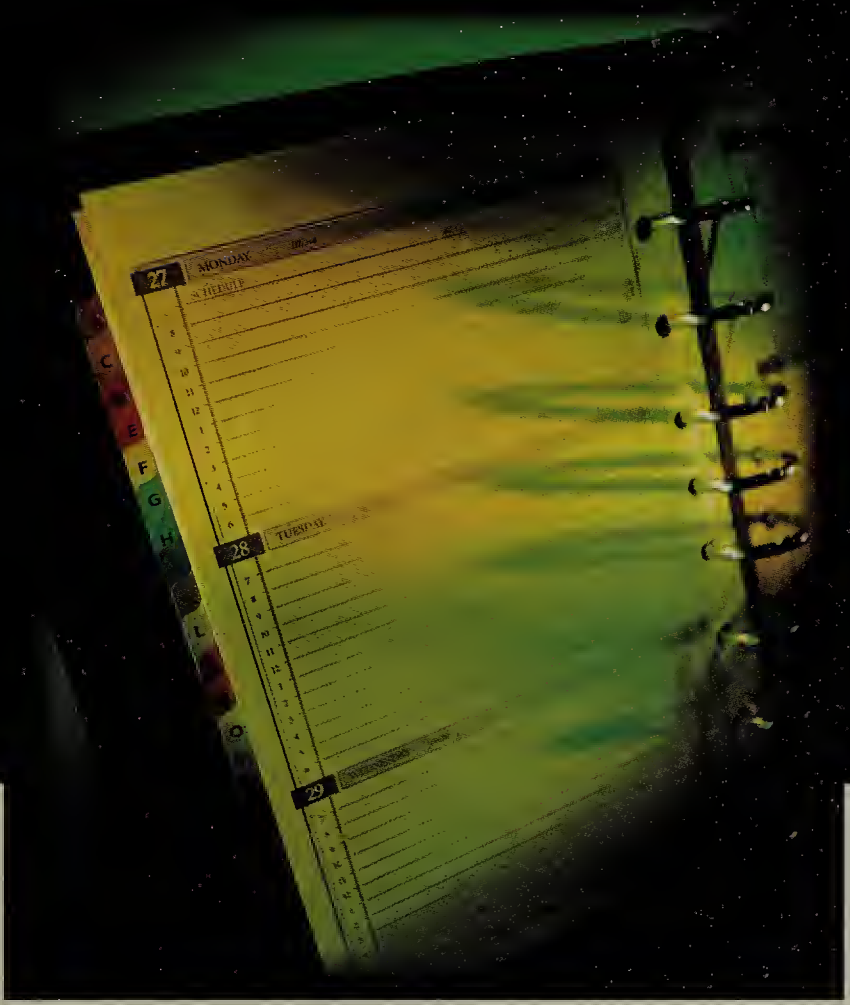

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Circle Reader Service **#21**

'NET INSIDER

It's a curve, not a point

The Internet is not good enough, or so many people would have us believe.

The quality is not good enough for IP telephony or IP-based virtual private networks (VPN). The security is not good enough for remote access or IP-based VPNs. And the reliability is not good enough for sending faxes or conducting electronic data interchange over IP. All in all, if you listen to some pundits, you'd think the Internet isn't of much use for anything real.

Scott Bradner

There is a theme to these pronouncements. They assume that there is actually some single point of service acceptability. Because that has repeatedly been shown not to be the case in the real world, it is reasonable to wonder how much real world understanding these pundits have.

This is not a new misunderstanding. A number of years ago, one of the telephone company standards groups did an exhaustive survey to determine the minimum quality needed in the telephone system. This involved a lot of experiments and survey work and is frequently cited as a landmark study of its type (though I've not been able to track down a copy). My problem with the conclusions drawn from the effort, which determined a point of acceptable quality. This conclusion shows a misunderstanding of the marketplace's dynamics.

For many years, most traditional telephone companies refused to invest in the infrastructure to support cellular phones because the voice quality did not meet the acceptable minimum. The assumption was that no one would want to use the service.

It was only after the frequency spectrum opened up and new providers were able to show that customers wanted the service that the mainstream phone companies made their move into the market.

Those people who say the Internet is not good enough for one application or another are missing the same detail that the phone companies did. There is not a single point of acceptability, but rather a curve of quality vs. other factors. These could include: convenience, as was the case with cell phones; cost; service coverage; ease of use; and many more.

CNN ran a story on IP telephony a week ago in which a user of the service was interviewed. This is a service that involves dialing the number of a local gateway from your regular phone, then having the call routed over the Internet to a gateway near the call destination, where the call is put back on the local phone network. The user said that there were a few problems with the quality of the service, but he seemed quite happy with the cost-quality tradeoff.

You should look closely at any pronouncement that a particular service cannot be successfully run over the Internet and see if there is a missing curve in the assumptions. Remember the cell phone.

Disclaimer: Since Harvard does not make pronouncements and this is one, it must be my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

Costa Rica

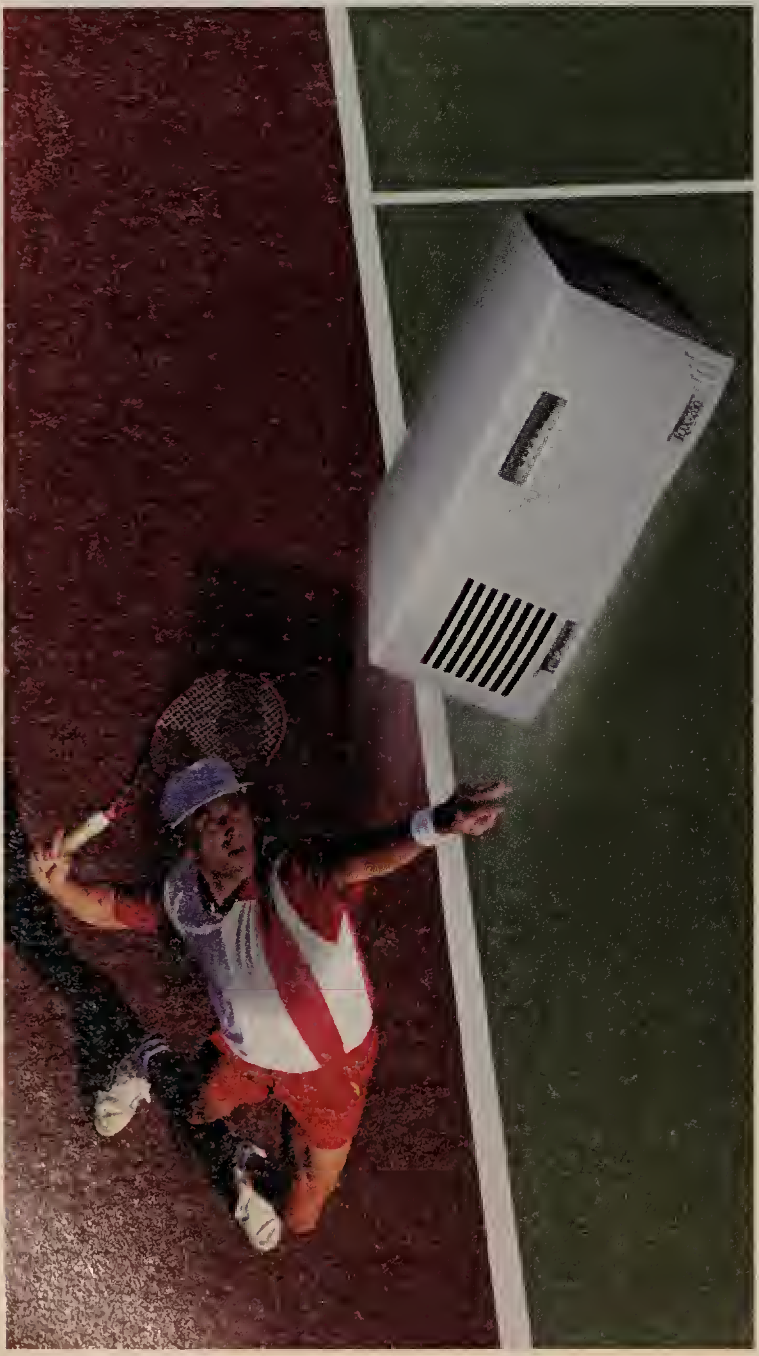
Continued from page 53

width links to handle the data sent to and from the voter-registration offices. Viquez admitted he had some anxiety about the network handling the data. "We have to have all the polling stations online, so it could be a problem," he acknowledged.

In the interest of citizens' privacy, the Costa Rican government does not plan to permanently store the fingerprint data on optical media. But Viquez said he expects the new plastic ID cards, which store the two fingerprints in bar-code format, will spur an increase in the use of this type of biometric-security in his country.

"In the future, if I go to a bank to do a transaction and the check is for a lot of money, they can tell me to put my finger on the fingerprint reader to check my identify with the print on the card," said Viquez. The same could happen when getting a driver's license.

Though the changeover may have its own difficulties, the Costa Rican government expects to see a sharp decrease in ID fraud, particularly bank-related fraud, with everyone using the new cards. "This modernization should really help," said Viquez. ■



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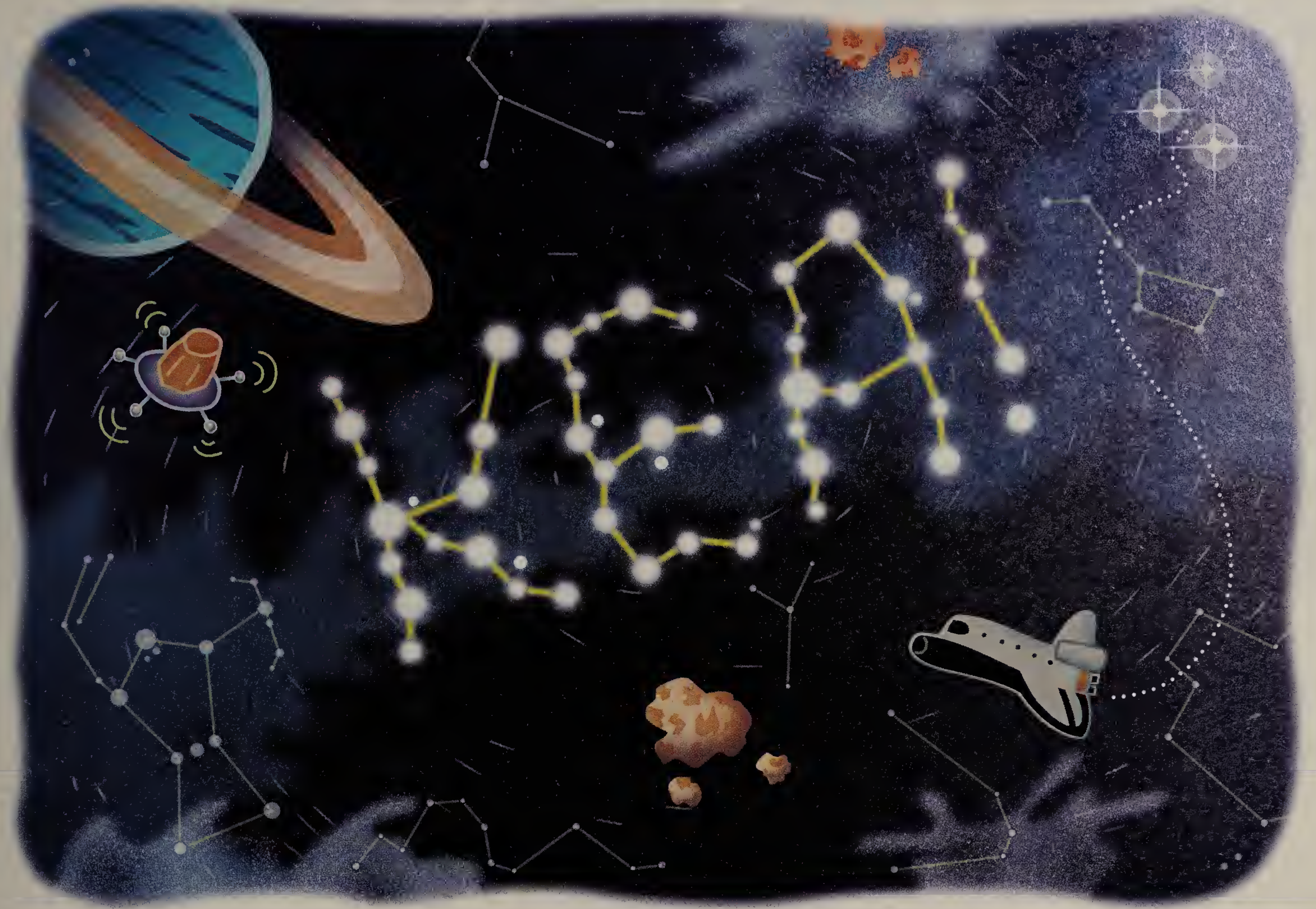

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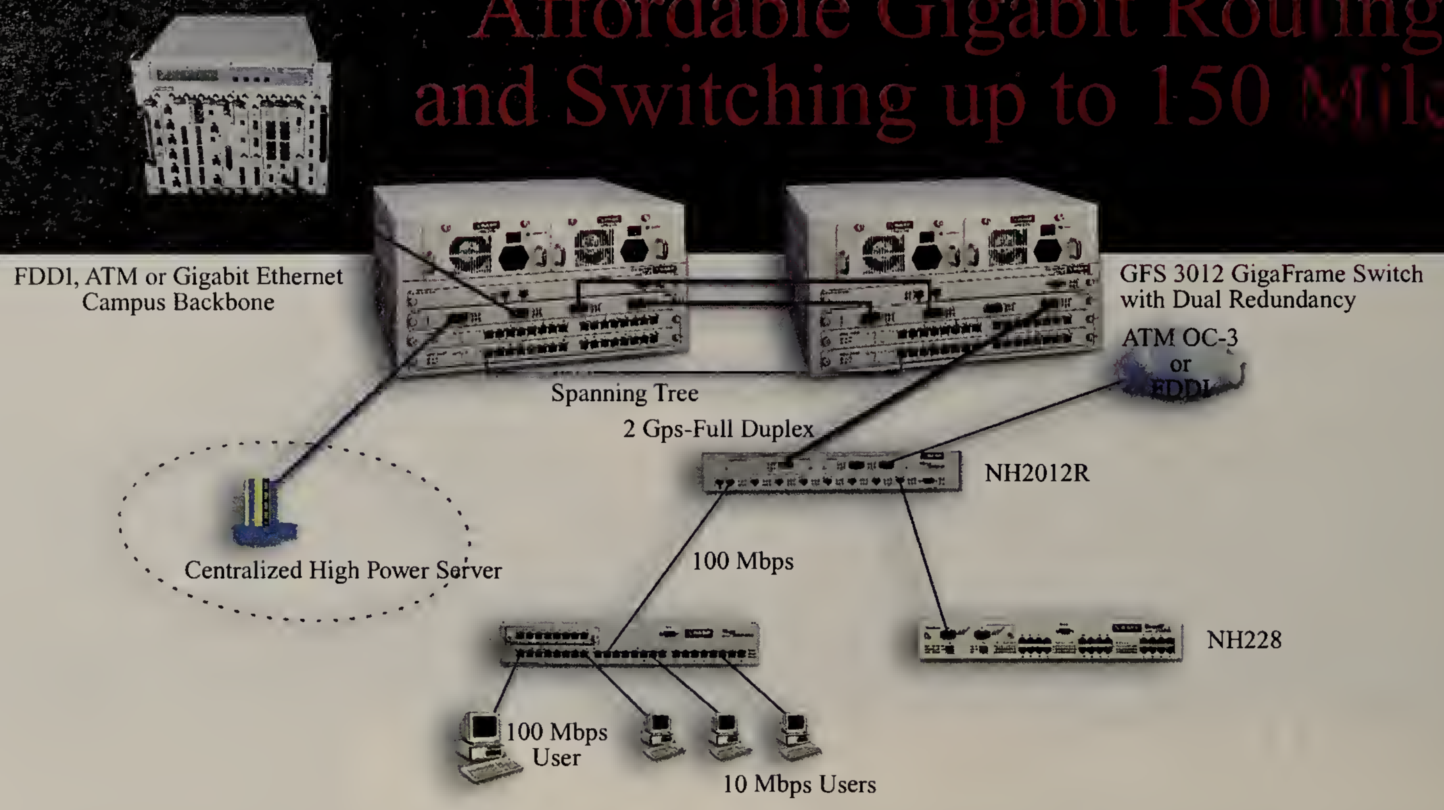

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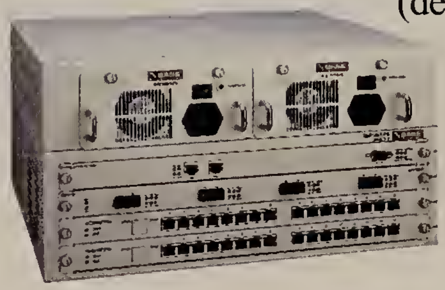

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*Circle Reader Service #***19**

Caching wards off Web access worries

By Bert Williams

The World Wide Web's rapid growth, coupled with the increased use of Web technology in corporate intranets, has ushered in an era of unprecedented levels of user frustration and ever-growing WAN costs.

Why? Because the Web's underlying infrastructure wasn't designed to support the demands now being placed on it. And it's only getting worse.

Web caching is the most popular approach to solving these problems. A cache acts as the middleman between the end user's browser and the Web server housing the content. When a browser requests a Web page, the request is initially directed to a local cache.

By creating a distributed system that stores frequently accessed content close to users, response times are improved while WAN traffic is reduced because Web requests are serviced locally without having to traverse the Internet.

There are two basic modes of cache operation: proxy caching and transparent proxy caching.

With proxy caching, or the nontransparent mode, each client browser must be manually configured to send all Web requests to the correct cache. There are major drawbacks to this approach.

First, each client can only hit one cache server, even if multiple caches have been deployed for scalability. Second, because the proxy caches generally cannot redirect requests for content to other caches, all pages must be stored on all caches, leading to unnecessary duplication of data.

Third, additional user delay and data duplication occurs because the cache must service all Web traffic, including intranet traffic. Finally, if a user's browser points to a cache that is down, then the user has no Web access until his browser is reconfigured or the cache returns to service.

Client administration is a major disadvantage of proxy caching because every browser must be configured to point to the cache. The amount of administration needed on the browsers increases the overall administrative burden because there are many more browsers than there are caches or intermediate systems.

The other mode of Web cache operation — transparent proxy mode — fixes many of these problems but introduces several new ones. In transparent proxy mode, the cache sits in the data path examining all packets bound for the Internet, intercepting and servicing the Web traffic.

While this eliminates one of the big disadvantages of proxy caching — the need to configure the individual browsers — clients still generally hit only one cache because there is just one active path between each client and the Internet. Moreover, network availability can be compromised because the cache sits in the data path. If the cache fails, users lose all Internet connectivity and possibly some intranet connectivity.

Transparent proxy mode can slow down all kinds of communication to the Internet. In this mode, caches must process every packet to filter out Web-related traffic while passing the rest along. This requires that caches be configured as next-hop routers or as the default gateway for clients with two network interfaces, one connected to the client side of the network and the other connected to a path to the Internet. The cache must be able to route between the interfaces so non-Web traffic that needs to go to the Internet can get there. Unfortunately, the processing architecture that works best for caches is not well-suited for examining high volumes of data packets.

Web-cache redirection is a new technique that helps solve the deployment and administrative problems associated with Web caching. Web-cache redirection removes the cache from the data path and improves cache performance by off-loading many CPU-intensive network functions they must perform.

Web-cache redirection is implemented on specialized LAN switches or routers already in the data path, providing connectivity to servers and caches. Unlike traditional network devices, Web-cache redirectors distribute processing capacity to ensure that packet processing is maximized and not limited by a single centralized CPU.

With Web-cache redirection, HTTP traffic is intercepted, the appropriate packet manipulation is performed, and the traffic is redirected to the cache housing the requested content. Meanwhile, all other traffic, such as Simple Mail Transfer Protocol or File Transfer Protocol, is switched at Layer 2 to the Internet. The cache is moved out of the data path, and the network functions performed by the cache are off-loaded to the redirector or, in some cases, eliminated entirely.

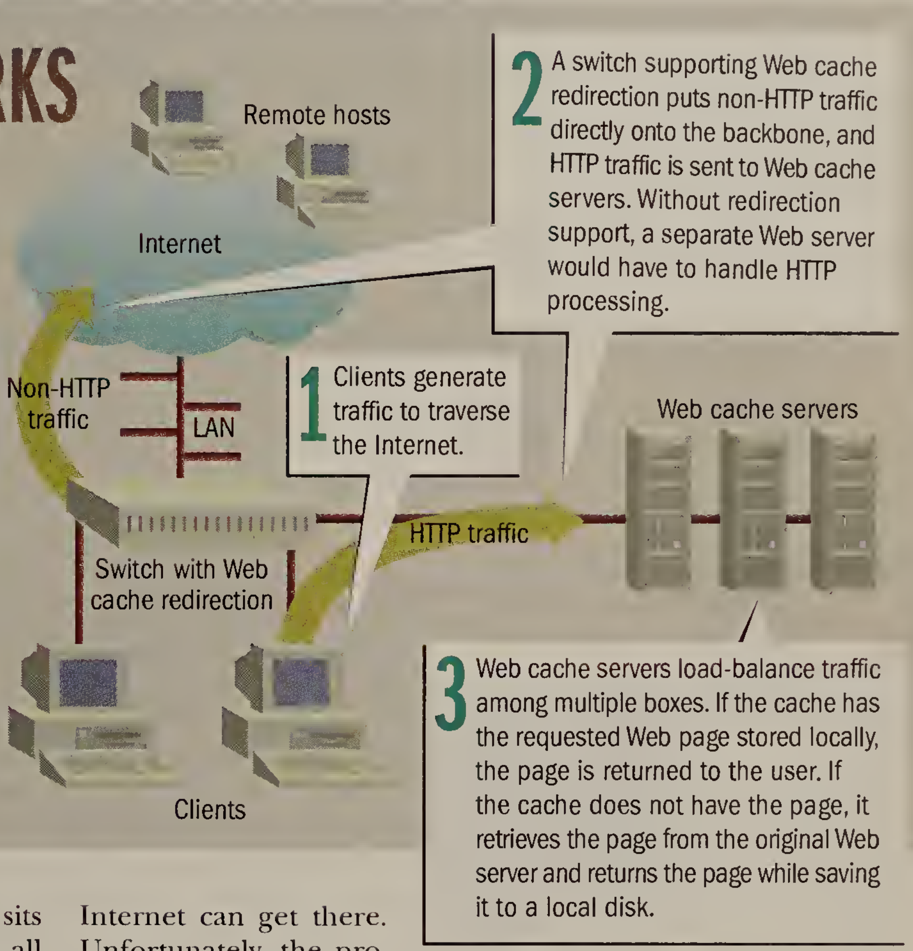
By removing packet examination and manipulation from the cache it frees up CPU cycles because the cache doesn't have to be configured to perform Network Address Translation or routing. Web-cache redirection brings caching as close to zero administration as possible.

Williams is director of business development at switch maker Alteon Networks, Inc. He can be reached at (408) 360-5500.

HOW IT WORKS

Web caching

The idea behind Web caching is to speed frequently used information along to the user. A new technique, Web cache redirection, also helps by taking network processing duties away from the server, storing frequently accessed Web pages close to users and boosting response times. WAN traffic is reduced because Web page requests are serviced locally without having to traverse the Internet.



1 Clients generate traffic to traverse the Internet.

2 A switch supporting Web cache redirection puts non-HTTP traffic directly onto the backbone, and HTTP traffic is sent to Web cache servers. Without redirection support, a separate Web server would have to handle HTTP processing.

3 Web cache servers load-balance traffic among multiple boxes. If the cache has the requested Web page stored locally, the page is returned to the user. If the cache does not have the page, it retrieves the page from the original Web server and returns the page while saving it to a local disk.

NUTTER'S NETWORK HELP DESK

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We are opening offices in several cities during the next few months. To minimize start-up time, management would like me to configure the servers and have them ready to install before we ship them to their final locations. I haven't worked with Novell Directory Services (NDS) enough to know how to approach this task. Do you have any suggestions?

Via the Internet

Before you start, plan how you want to lay out the NDS tree and decide on naming conventions for things such as print queues and printers. Then bring the servers online as one network. Because you'll probably be using routers to connect the offices, you could use one of your existing servers to function as a simulated router. Just install additional network cards and connect one server to each of those cards. Bring the servers into the NDS tree one at a time using the DSTRACE screen to make sure the servers are not having problems talking to each other.

You've got to do a few things to make sure you can make NDS changes while the servers are disconnected from the network. Start by partitioning the tree from the root of the tree. After this operation is complete, use NDS Manager to remove any replicas from the new servers. This will allow the servers to be disconnected from the tree and still accommodate the creation of users, changes in group configuration and other administrative functions.

Once the servers are at their final location, think about partitioning the tree so each partition centers on a physical location. This will help minimize NDS WAN traffic. Lastly, plan for time synchronization. If you are going to have multiple servers, make them primary time servers.

EDITORIAL *insights*

AT&T/TCI deal offers feds a way out of regulatory mess

A few weeks ago, I urged the FCC to carefully review the impact of the Bell Atlantic/NYNEX merger on customers before approving SBC's buyout of Ameritech. As you can see from the letters on the facing page and the comments in our online forum (www.nwfusion.com/forum), the Bell Atlantic/NYNEX deal has been a bust in terms of delivering new services, improved support or lower pricing. Nor has the addition of NYNEX's resources made Bell Atlantic more aggressive about competing in other regions.

That's why I'm so excited about AT&T's plan to acquire cable television giant TCI. I can't say whether the deal makes sense for AT&T shareholders. There's certainly a lot of work that will have to be done to TCI's cable plant to accommodate all the services these two firms envision. Nor do I believe this deal will bring tremendous benefits to *Network World* readers, at least in the short run. This is consumer-focused networking, kids.

But the beauty of the deal is that the AT&T/TCI merger will break the regulatory stalemate. With TCI's cable assets, AT&T will have the potential to reach nearly one-third of the homes in the U.S. This deal will create the first real competition for the RBOCs — something that will force them to defend themselves by improving service, innovating and cutting prices. It will force them to counteract and go after long distance. The deal will get all the players fighting. That's a beautiful thing because when they fight, you and I will benefit.

On paper, the RBOCs applaud this merger. "In light of this news, federal regulators need to act swiftly to drop restrictions that are keeping US WEST from fully serving customers in markets such as long distance and data networking," said a US WEST Media Group spokesperson in a *New York Times* article.

Amen. But I doubt US WEST or the other remaining RBOCs will be so warm to this competition when it finally arrives. The RBOCs don't have tremendous customer loyalty, and they will have to go through some wrenching changes to compete effectively in their own regions, let alone challenge the long-distance providers.

So here's some more unsolicited advice for FCC Chairman William Kennard: approve the AT&T/TCI merger as soon as the paperwork hits your desk. It will make your life easier by taking the telecom battle out of the halls of government and bringing it into the marketplace.

John Gallant, editor in chief jgallant@nww.com

Yankee Ingenuity • Howard Anderson

By playing it safe, Gerstner fails to make the grade

To: Louis V. Gerstner, president, IBM
From: Howard Anderson, managing director, The Yankee Group
Re: Your performance evaluation

Dear Lou:

You have been president of IBM for five years now. The time has come for your performance review, and it is my unhappy duty to give you a C. Believe me, this hurts me as much as it hurts you.

You started out great. Your first task was to stabilize the company, and you did a first-rate job. You cut $7 billion out of expenses and brought aboard a real talent, Jerry York, as chief financial officer. You retired some dead wood, took massive write-downs and cleaned house.

The conventional wisdom is that you have done a masterful job over the past five years. IBM stock is at $120 per share, almost double what it was 14 months ago. However, you have accomplished this feat using a variety of cute tricks that I do not find acceptable.

Lou, you have spent $25 billion over the past few years buying back your own stock. In the meantime, you are losing ground in storage, servers and even mainframes. Your sales are up only 3.5% at a period when IT spending is at an all-time high.

You have genuflected to Wall Street (and made a few hundred million for yourself), but IBM has a higher calling. There is an implicit contract between IBM and The Yankee Group 200 big users. You are in violation of that contract, the provisions of which require IBM to lead, to take the high ground, to tackle the difficult technical issues.

The only reason to ever buy back your own stock is because that is the single best use of your capital. In other words, there is no other area in which you could invest your money that would show better or more strategic value. I don't accept this.

IBM has twiddled its thumbs while internetworking has become a $40 billion market. Today, 120 million people access the Internet and IBM's sole effort to tap into this market is to spend $200 million advertising electronic commerce. Every telecommunications company is struggling to build infrastructure, write operational support systems and prepare for broadband, and what has IBM done? Sat on the sidelines buying back its stock.

Lou, Lou, Lou — you're blowing the most impressive opportunity in 50 years!

Now, Lou, I know you have seen every one of your strategic alliances — Rolm, Discovision, Taligent — fail. But that's no reason to retreat to your conservative little womb. IBM owned 20% of Intel and sold it for $600 million. That single investment would be worth $30 billion today. But that didn't happen on your watch.

You invested $300 million in small companies, trying to get them to write software for OS/2 before Windows. Today, this series of investments has lost 96% of its value. No wonder you're gun-shy! That's a terrible record, but that didn't happen on your watch, either. IBM's thinking at the time was that making an investment was better than out-and-out paying companies to write for OS/2.

But look at the genius you showed with Lotus and Tivoli, two acquisitions that did happen on your watch. Seventy percent of Lotus was junk, but Notes was a winner. You paid $3.2 billion for a $100 billion company — 32 times sales. And your instincts were right: Groupware is hot! So why be so conservative now?

Lou, let's be frank. Despite the high stock price, IBM is having its head handed to it. We have gone from an IBM-dominated era to the post-IBM era on your watch. There's this great national asset, Lou, and you are slowly starving and destroying it while doing almost a leveraged buyout. You are slowly strangling the future of IBM for a better financial present. Shame on you.

Maybe it's time to retire, Lou. Maybe IBM needs a gutsier, younger guy whose idea of vision is more than a healthier bottom line.

Your biggest customers have been forced to become their own systems integrators — or hire you or Computer Sciences or Andersen Consulting (no relation to me) to do what you should have done.

Lou, if you had been growing revenue 10% annually and leading in hot areas such as internetworking and servers, and if competitors hadn't been growing 400% faster than IBM, I might be a little more forgiving.

So try harder. Be bolder. And I hope we won't have to have this little discussion again.

Anderson is founder and president of The Yankee Group, a Boston-based consultancy. He tries to keep his skepticism from degenerating into rampant cynicism, a battle he appears to be losing. He can be reached at handerson@yankeegroup.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification

Readers rant

Editor's note: The following letters are in response to our editorial "Has merger mania benefited telco customers? Not in Bell Atlantic's region" (June 8, page 50):

I live in the Lehigh Valley of Pennsylvania. It took a Bell Atlantic technician four visits to install a second line so I could telecommute — at $65 per visit.

I recently switched to RCN, a Princeton, N.J., company that offers cable TV and local, long-distance and Internet service for business and residential customers. Hopefully, RCN will grab enough market share to send Bell Atlantic a clear message: It's not about taking care of Wall Street alone; it's about taking care of your customers.

Christopher Landes
Nazareth, Pa.

I'm a Bell Atlantic customer. Grading Bell Atlantic in the short term, you can confidently state your claims that the cost of phone service has not lessened; this is true.

There have been some improvements in other areas besides service. I have been able to add additional phone lines for free, something that in the past cost over $200 per installation. And it seems that 56K bit/sec connections are very reliable.

Innovative? Well, before the merger, if you called for residential ISDN service, you'd be lucky to find one person who even knew what the acronym stands for. Today, you can order ISDN service, installation and configuration of the modem, too, plus get trouble-shooting help with one call to their GET ISDN service. It's not painless, but it's better than before.

Bell Atlantic has said it will begin constructing a next-generation, data packet-switched, long-distance network in July. The new network will provide the regional platform for data communications for customers across the Bell Atlantic region, the nation and the world. To my mind, they are at least making a solid effort to improve things for end users — residential ones at that.

Peter Strifas
Computer consultant
Long Island, N.Y.

I called Bell Atlantic's service number one day because one of my modem lines had died. The person who took my call was in Richmond, Va., and I'm in Forest Hill, Md. He was the nicest guy and tried to fix the problem immediately but was unable to locate it. He must have called me three times throughout the day to keep me up-to-date.

He eventually told me that the problem was in a local switch and someone from the local service center may call to tell me when it was repaired.

A few minutes before 5 p.m., I received a call from someone local who started blasting me for not calling them about the problem, which they knew about and had now fixed.

My reaction was "Excuse me, I followed proper protocol by calling the 800 number for repair." So the service provided by the service person in Richmond was great but the local people in Bel Air, Md., ruined it by blasting me for complaining about the phone line!

Chuck Masters
MIS manager
Old Line Plastics, Inc.
Forest Hill, Md.

Answers to your questions from a former Nynex customer:

Has customer service improved? No, but it was OK before.

Are you paying less for service? Sometimes. The day rate for in-state long-distance service has declined. Other rates have stayed the same or increased.

Is the merged company more innovative? Don't know.

Has the merger made life easier? No, it's about the same.

The local phone company has spent a fortune repainting trucks and reprogramming billing software from New England Telephone to Nynex and now to Bell Atlantic. Now we are facing a new surcharge for local number portability, so competition (whether it actually exists or not) will have increased rather than decreased rates.

Why not just require the Bells to reduce their line charges to end users to what they charge resellers now? All customers would see lower rates, and the Bells could save enough on advertising and paperwork to get a larger profit. The only true competition will come from cable TV and wireless providers, not from resellers who only add a layer of bureaucracy and cost.

Roy Schweiker
Concord, N.H.

I live in Bell Atlantic's territory, in the former Nynex section, and I have seen squat in the way of improvements. I was hopeful that the merger would bring a decrease in the price of ISDN because I wanted this service for my home. Presently, Bell Atlantic is pushing like hell for people to get on the ISDN bandwagon and wondering why they aren't getting any results. Here's why:

First, people have 56K bit/sec modems, which work suitably in most of upstate New York; connections below 52K bit/sec are rare.

Second, Time-Warner Cablevision has rolled out RoadRunner modems, which promise up to 2.7M bit/sec of bandwidth and usually deliver (site-dependent, of course). This service is installed for $100 and runs for $40 per month.

Third, extra phone lines run $40 to $50 per month. When Roadrunner is 48 times faster and $10 cheaper, why would one want another phone line?

Fourth, ISDN adds an additional $17 per month to your regular phone costs and then costs another 1 cent per minute per channel to use, regardless of whether you are using it for voice or data.

And Bell Atlantic wonders why it can't sell ISDN?

Glenn Lasher
Installation systems analyst I
IFS International, Inc.
Troy, N.Y.

I was a Bell Atlantic customer for a period of time. I am now a Bell South customer.

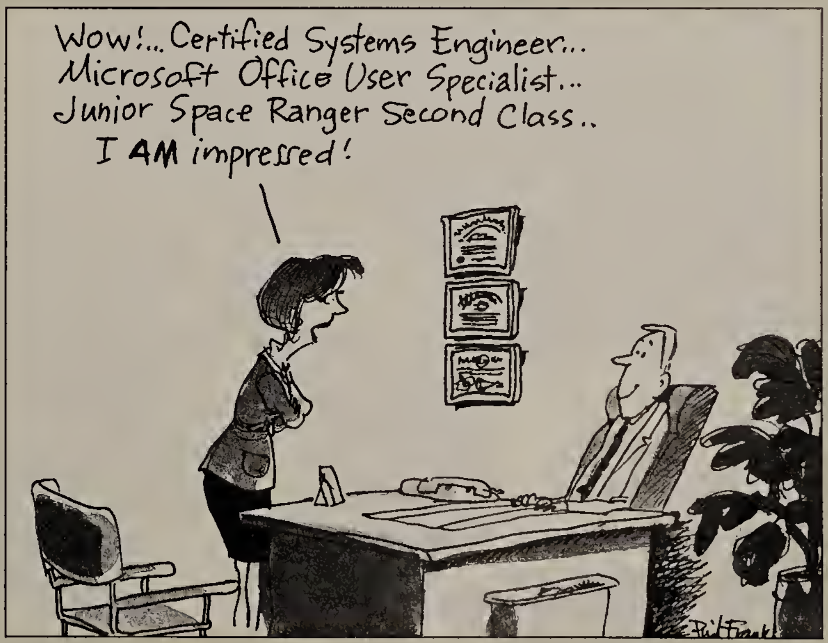
What differences did I notice when I moved from Maryland to Alabama? Not many, except that the price of bits is far lower down here than in the Bell Atlantic region, a flat rate ISDN 2B+D being almost $200 less per month in Alabama.

I am quite happy with my ISDN service in Alabama. I laugh at Bell Atlantic each month when I get Bell South's bill for it.

I am ashamed that my father helped build the company that eventually became Bell Atlantic because his predictions came true. He said they would lose all their talent because they didn't care about their people anymore, and they would become corrupted and greedy and overcharge for services that cost pennies a month to provide. No truer words have ever been spoken, and no more accurate prediction made.

John Hamilton
Chairman and CEO
Pursuit Ballistics, Inc.
Huntsville, Ala.

Teletoons


Wow!... Certified Systems Engineer...
Microsoft Office User Specialist...
Junior Space Ranger Second Class..
I AM impressed!
Phil Frank

Phil Frank and Joe Troise baba@sfgate.com

Bell Atlantic responds

Your editorial "Has merger mania benefited telco customers? Not in Bell Atlantic's region" (June 8, page 50) raises some excellent points about telecom mergers, especially the need to assess what customers perceive as the benefits. The new Bell Atlantic has made significant progress in servicing our business customers. We recognize that we are not perfect, but let me summarize what Bell Atlantic has done for its business customers since the merger.

- **Service.** Bell Atlantic conducts a customer care survey every month to determine how customers rate our services. We then allocate resources to areas that need improvement. To keep our employees current, we spend several million dollars annually to train and retrain workers. As a result, when we look at criteria such as answering calls promptly, connecting to the right person and promptly handling requests, the number of customers who rate our services as very good or outstanding increases each month.
- **Cost.** Bell Atlantic provides competitively priced, flexible communications solutions. For example, we offer significant discounts on ISDN, for a variety of usage levels, to businesses interested in having part of their workforce telecommute. We also offer a variety of calling plans designed to meet customers' needs.
- **Innovation.** Bell Atlantic continues to invest in new and developing technologies. In March, we formed the Bell Atlantic Data Solutions Group, a subsidiary dedicated to providing complete, end-to-end data solutions for customers on a nationwide and global basis. And several weeks ago, Bell Atlantic announced plans to invest $1.5 billion in our data network. (We have installed over 50 ATM switches, 190 frame relay switches, 280 SMDS switches and 2,500 SONET rings.)
- **Simplicity.** One of the primary reasons for the merger was to make life simpler for our residential and business customers. On the business side, we are pursuing this goal through streamlined communications, a wider portfolio of services, wider geographic support and improvements to our billing process.

The new Bell Atlantic has made significant progress in servicing our customers. This effort has only begun.

Joe Cascio
Vice president, marketing operations
Bell Atlantic
Arlington, Va.

Get more online:
www.nwfusion.com

Go online to read the full text of Bell Atlantic's response and other letters to the editor.

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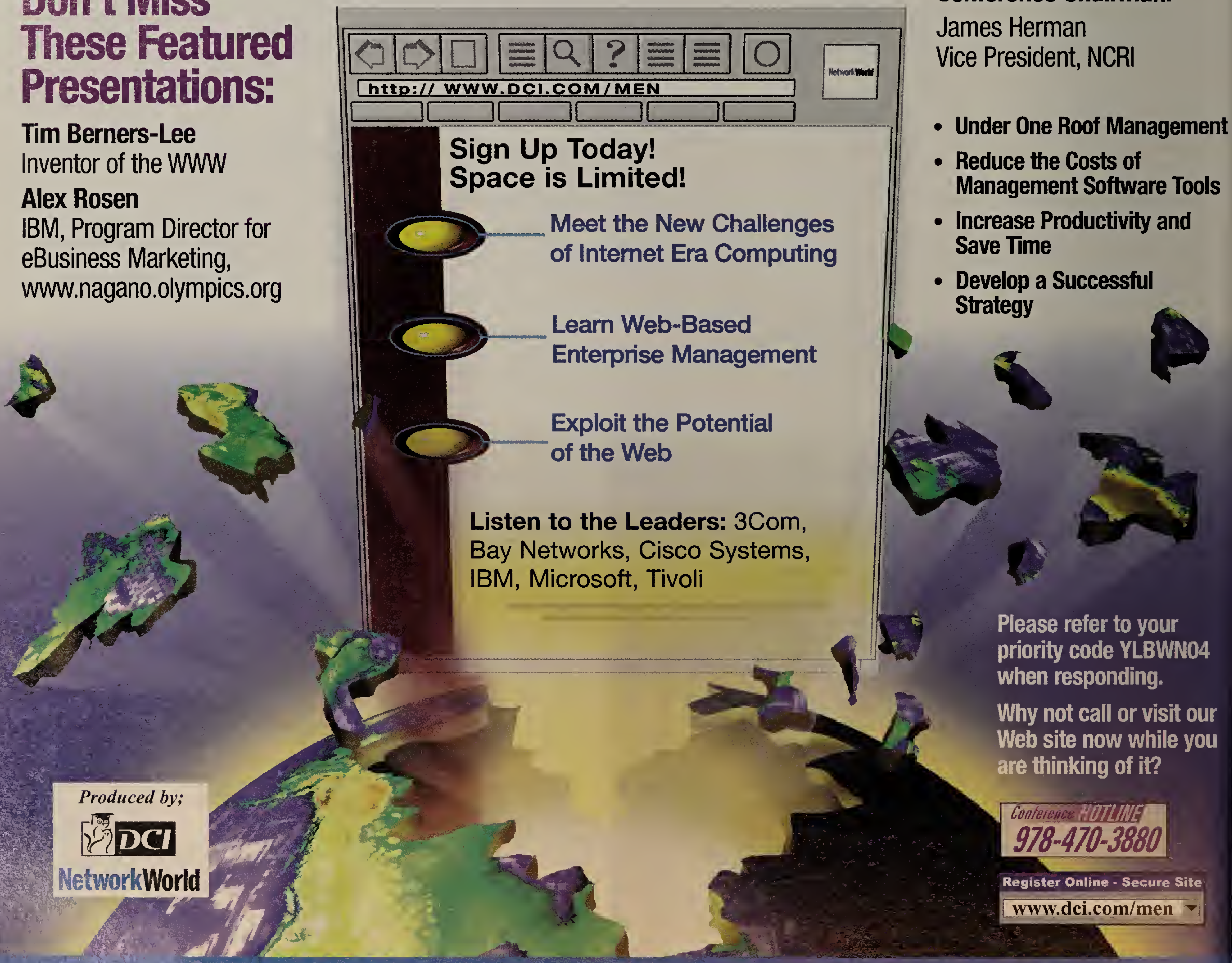

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FACE-OFF

Which thin-client approach makes the most sense?

Once you've made the decision to go with thin clients, you still have some choices to make. Microsoft says this environment should be Windows-based; IBM contends there are many platforms that thin clients should support, including Java.

JEFF SCHEID

By Howie Hunger, IBM

In September 1996, IBM became the first major vendor to announce a thin client. Our IBM Network Station offered what customers were asking for: an easy-to-use, easy-to-manage desktop client free from the ever-spiraling costs of desktop devices. We began shipping Network Stations in volume in March 1997, and have thousands of customers around the world using them.

Since then, almost all of the major developments in the IT industry have been in reaction to thin clients. Some major industry vendors, notably Microsoft Corp., originally dismissed the idea of thin clients. But when they saw the reaction of customers — well, now we're seeing announcements from these previous skeptics about Windows-based Terminals (WBT).

Let me tell you what a WBT is — it's a terminal that can access Windows. For some people, perhaps that's enough. But our customers are telling us they want more. That's why IBM's Network Series 100 allows you to access the Internet and intranets, and perform word processing, e-mail, spreadsheets, or just about any Windows application that most of us use. Yes, the Series 100 can access Windows, but it also can access existing applications on mainframes, Lotus Notes, RS/6000 and AS/400 servers. And it costs less than $500.

In addition to the Series 100, IBM offers two other Network Station models: the Series 300, our Internet-intensive device; and the Series 1000, our Java-enabled client.

Most users don't want to stop and think about where their data resides, nor about all the terms being bandied about: thin client, lean client, network computers. Users just want to know they can access their data and get on the Internet and intranets quickly and easily.

For IBM customer American Eagle, the world's largest regional airline, Network Stations are well-suited for uses such as keeping track of parts, and other functions that previously were very paper-intensive. Other customers, such as Roberts Express, a shipping company that is a subsidiary of Federal Express, want to migrate quickly to Java applications. For them, our high-end Java-enabled Network Station Series 1000 fits the bill.

That's why IBM is offering more than one thin client — customers want choices. And that applies to customers who want to keep their PCs because they are power users. I'm frequently asked if thin clients will replace PCs, and I tell folks, no. In almost any enterprise, there's room for both PCs and thin clients to reside side by side. We're doing it within IBM. In fact, in every situation in which we're replacing older technology, IBM is looking at providing IBM Network Stations to our employees.

So let's get past the rhetoric and get down to facts. Yes, WBTs are a good idea — such a good idea that, for more than a year, our Network Stations have been doing what WBTs do, with a lot more value for similar costs.

Hunger is director of channels and marketing for IBM's Network Computer Division. He can be reached at (914) 766-3512 or hunger@us.ibm.com.

By John Frederiksen, Microsoft

Our customers tell us they are looking for more than just a thin-client device that will lower their costs. Rather, they are looking for a thin-client solution consisting of hardware, software and development tools.

According to industry analysts, more than 85% of organizations are asking for ways to apply the flexibility and functionality of traditional 32-bit Windows-based PCs to legacy desktops and terminals. They have spent years putting their infrastructures in place and are realizing significant benefits in productivity and reliability, so they do not want to sacrifice prior investments in Windows. This is an important distinction to make when discussing the merits of the various thin-client approaches. If a thin client can't deliver the productivity and line-of-business applications users require, then the device is really only an expensive paperweight.

One size does not fit all, and Microsoft's goal is to deliver a full range of computing solutions, scalable throughout an organization, that meets users' needs. By extending the Windows family to include thin clients, customers can build upon their investments in Windows rather than having to rip out and replace segments of their current environment. At the same time, Microsoft's thin-client approach supports a variety of usage scenarios and provides the lowest total cost of ownership (TCO). Our approach is based on the scalable Windows family, which delivers a consistent platform for a number of different devices, from the super-thin WBT to the full-featured and powerful Windows NT Workstation PCs.

The WBT is the ultimate terminal upgrade. It launches and runs a remote Windows NT Workstation 4.0 session when connected to Windows NT Server 4.0, Terminal Server Edition. As a stateless device, the WBT typically contains 4M bytes of RAM and 4M bytes of ROM, and runs either the Independent Computing Architecture protocol or Remote Desktop Protocol. With the WBT, the server handles all processing and storage. A WBT typically costs less than $500 and will lower TCO by as much as 37%.

Customers like the WBT because it is low-cost and enables access to Windows-based applications. Terminal users can now access the latest and greatest Windows applications such as browsers, e-mail and Java applications. Access to the Windows APIs enables developers to deliver a new breed of line-of-business applications based on the simplistic and intuitive Windows graphical user interface. As a thin client for task-based workers, the WBT is the best option for companies looking to upgrade their terminal environment.

If you're considering thin clients, you'll find your needs best met by well-managed PCs and WBTs that provide the lowest TCO, greatest functionality and flexibility, most current Java and HTML support, and the best user experience. Windows gives you the benefits of centralized management with the power of distributed computing.

Frederiksen is Microsoft's group product manager for Windows NT Server, Terminal Edition. He can be reached at (425) 882-8080.

Go online to air your views on this issue in our Fusion Face-off running through July 3. Hunger and Frederiksen will be adding their thoughts to the discussion.

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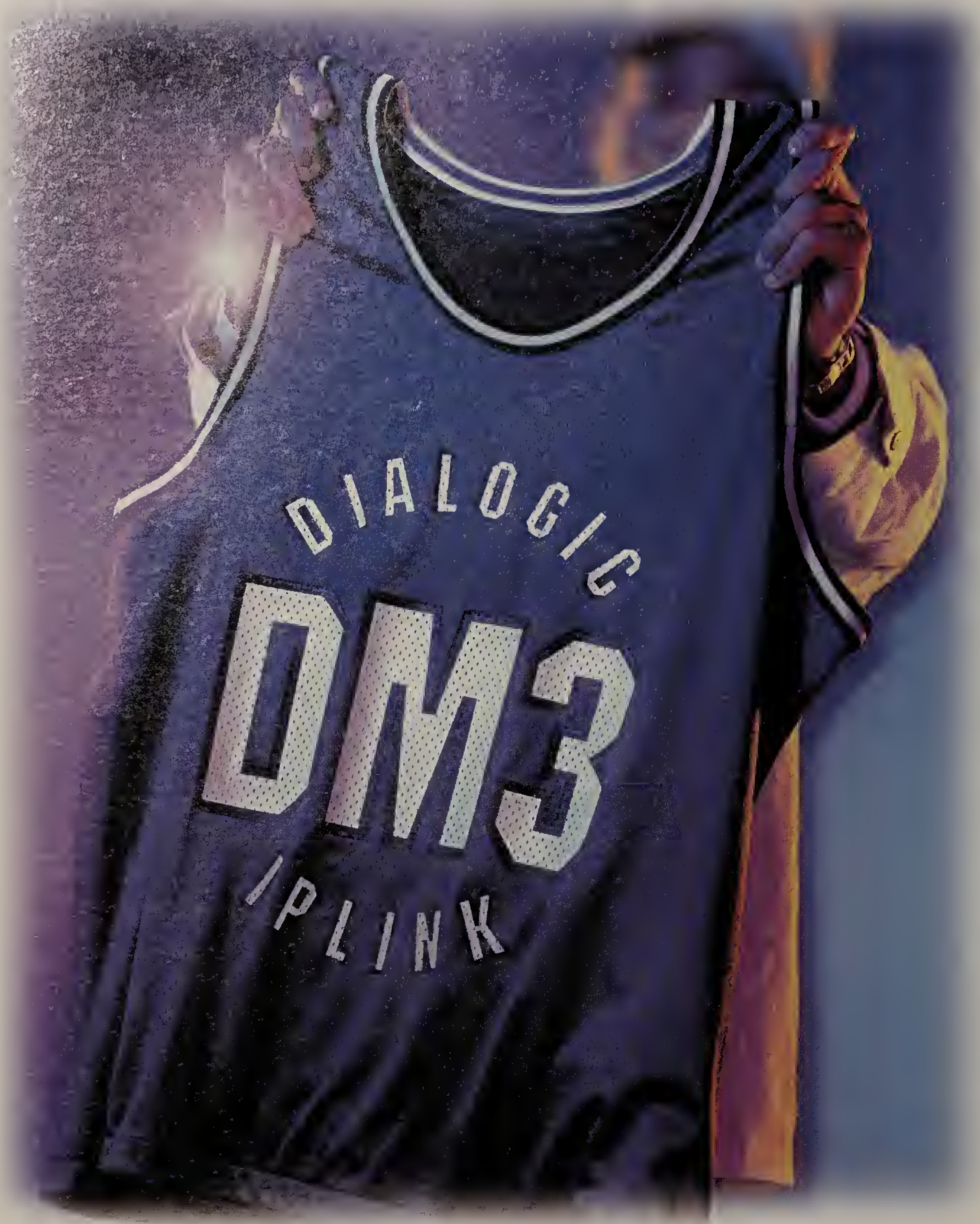

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IS09

Circle Reader Service #**34**

Making IP speak

It's loud and clear: Voice over IP offers cost benefits, good sound quality.

Would you be surprised to find that the sound quality of voice calls made over the Internet is comparable to that of calls made over the public switched telephone network? That's what we found after working out four voice-over-IP gateways in the lab.

Oki Network Technologies' Internet Voice Gateway got the Blue Ribbon in our test for its easy installation and low price. You'll find the full test results in the Review below.

To help you with your own evaluation, the Issues and Trends story on page 70 outlines some differentiating features of voice-over-IP gateways, including digital and voice interface configuration, redundancy, compression schemes and standards support.

You can consult the Buyer's Guide Chart on page 72 to see which of 26 products has the features you want. Or go to Network World Fusion (www.nwfusion.com) to check out an online version with even more specs to consider. There you'll also find the Interactive Buyer's Guide, which makes it easy to find the voice-over-IP gateways with the features you deem most important.

By Jeffrey Shapiro

REVIEW

Voice and data together? Not on *my* network.

That's what many network managers said just a few years ago. They worried that voice traffic would suck up bandwidth and interfere with vital data transmissions. And early Internet telephony suffered from poor-quality voice communications, difficulty with directory assistance and an inability to integrate with applications such as voice mail.

Our tests of four IP telephony gateways show that's no longer the case. With the four products we tested, the quality was better than cell phone calls. We liked Oki Network Technologies' Internet Voice Gateway BS1200 the best for its easy installation and low price. At $7,395 for four channels, this device can show a quick return on investment for a company with multiple geographically dispersed branches.

But large companies with extensive investment in IP-based frame relay networks might benefit with highly scalable server-based products, such as Inter-Tel, Inc.'s Vocal'Net and NeTrue Communications, Inc.'s NeTruePhone. For a company simply trying to connect two offices together over the Internet, V/IP, a product from Micom, a division of Nortel, might be the better choice.

We invited many more vendors than the four we tested, but we found that the vast majority of companies were still in early beta testing and preferred not to submit a first-version product for review.

On the other hand, one company's product was so large (about the size of a refrigerator) the firm said it would need weeks to prepare to ship the product to us.

The products prove the Internet has emerged as a cost-effective alternative to the public switched telephone network (PSTN). The new generation of Internet telephony systems are gateways that connect to TCP/IP networks — the Internet or private IP-based frame relay networks. A company that maintains a dedicated IP backbone or high-speed connection to the Internet can set up a voice-over-IP gateway on the network in the same fashion as an e-mail or Web server.

Despite the enthusiasm, it is important to note that while private networks can offer a reliable voice-over-IP service, any product deployed over the Internet is at the mercy of available bandwidth resources. Peak traffic periods on the Internet could result in a poor-quality conversation.

Dozens of companies are releasing Internet telephony systems that provide real-time voice communications over the Internet. These products don't require you to use a microphone attached to a sound card on your computer. You use your telephone as usual, but instead of dialing 9 to get a telco dial tone, you dial a 6 or a 5 to get an Internet dial tone. Surprisingly, call quality across the 'Net is comparable to calls made over the PSTN.

Call handling

Perhaps the most important factor in voice-over-IP products is call handling, or the ability to emulate and integrate with existing phone systems. The ideal is 100% transparent integration; in this scenario, you dial 8 or 9 to get a dial tone and your PBX automatically chooses the least costly route, be it an IP connection or a more traditional one.

None of these voice-over-IP products approaches the ideal. At best, callers are required to enter access codes akin to those used with traditional tie lines, especially for the products aimed at service

Score Card

	Call handling (20%)	Manageability (20%)	Reliability/ redundancy (15%)	PBX integration (15%)	Scalability (10%)	Documentation (10%)	Installation (10%)	Total
Internet Voice Gateway BS1200	9 x .20 = 1.8	8 x .20 = 1.6	9 x .15 = 1.35	7 x .15 = 1.05	9 x .10 = 0.9	9 x .10 = 0.9	10 x .10 = 1.0	8.6
Vocal'Net	8 x .20 = 1.6	9 x .20 = 1.8	8 x .15 = 1.20	9 x .15 = 1.35	9 x .10 = 0.9	8 x .10 = 0.8	7 x .10 = 0.7	8.35
V/IP	8 x .20 = 1.6	9 x .20 = 1.8	7 x .15 = 1.05	8 x .15 = 1.20	6 x .10 = 0.6	8 x .10 = 0.8	6 x .10 = 0.6	7.65
NeTruePhone	8 x .20 = 1.6	7 x .20 = 1.4	8 x .15 = 1.20	7 x .15 = 1.05	9 x .10 = 0.9	3 x .10 = 0.3	8 x .10 = 0.8	7.25

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

providers looking to offer Internet telephony services.

For example, in order to get access to the NeTruePhone and Vocal'Net systems you have to dial user ID information, much like you do with a voice messaging or calling card service. The Inter-Tel, and especially the NeTrue system, appear best suited for service providers such as ISPs, though both can be set up and configured for businesses.

Call quality, however, is as good as a standard telephone conversation, even on networks loaded with data. That's due in part to the fact that all the products we tested support a small 8K bit/sec packet (as the ITU G.729 standard requires); such systems don't suffer when bandwidth is limited.

In-band integration with call processing systems worked well all around. Under load, however, we found a tendency to receive packets late, resulting in a small echo known as jitter. Jitter suppression technology is a clear requirement for these systems. Of all our participants, the Oki system controlled jitter best and provided a lot of documentation on understanding the cause of jitter.

Manageability

Voice-over-IP systems are administration-intensive, forcing you to designate which ports can be configured for voice and which for fax, as well as ways to integrate the voice-over-IP system with phone systems. Thus easy administration is a big plus.

Inter-Tel's Vocal'Net leads this field with the ability to manage its databases, line interface cards, network interface cards (T-1s, E-1s and more) and quality-of-service (QoS) options. Inter-Tel also has an impressive call accounting and call management package called Inside Track.

Oki's Internet Voice Gateway is managed through a serial interface, much like a router. The remaining products are managed through dialog boxes in Windows 95 (Micom's V/IP cards) and Windows NT (Inter-Tel's Vocal'Net and NeTrue's NeTruePhone).

The graphical user interface-based applications use simple data entry screens, not unlike the dialog boxes that abound in the Windows Control Panel. SNMP management is a prerequisite for these systems. SNMP allows the devices to be managed along with other TCP/IP systems as a unified collection of Internet services. According to the vendors who supplied the information in our Buyer's Guide Chart on page 72, all these products support SNMP.

PBX integration, reliability, scalability

All the products we tested let you plug in standard telephone lines and have a range of digital and analog options. Inter-Tel's Vocal'Net provides more sophisticated and advanced PBX integration options than the rest of the products, letting you set up lines for a variety of telephone system integration options. With Vocal'Net we could connect directly to the telephone company (gateway ports) or to a PBX or key system.

While the voice-over-IP systems we tested were not running for long periods, the hardware architecture we inspected was impressive and clearly designed to run for long stretches without failure. All the systems remained stable during tests, and all but Micom's can be clustered using third-party redundancy tools for Windows NT.

However, to illustrate just how vulnerable the technology still is, we were able to shut down every system we tested by simply dropping User Datagram Protocol (UDP) packets at our firewall. This left us wondering how we could reconcile our voice-over-IP plans and security concerns.

Like reliability, it's hard to test scalability, especially with only a single unit from each vendor. There was not much information in any product's documentation detailing how to tie systems together as a single cluster. Vocal'Net's and NeTruePhone's software could clearly accommodate hundreds, if not thousands, of users. All the systems except Micom's run under Windows NT. While Micom is working on an NT version, the Micom cards under Windows 95 currently are a difficult sell for scalability.

Oki's solution integrates with the Internet Domain Name System (DNS). Oki's DNS feature maps IP addresses to an Internet telephone "numbering plan," using IP addresses of the units as gateways or routers of Internet voice traffic. The Oki system allows you to resolve up to a maximum of 2,045 such host gateways using DNS.

Without using DNS, you would have to enter host or gateway lookup information. It was unclear how the other products we tested find gateways on the Internet (other than implicit linking of systems over point-to-point virtual circuit) to patch a call through. We could thus initiate conversations only between two identical systems. (Proponents of Internet telephony are working on standards to allow gateways to interoperate and communicate with each other, just as the switches on the PSTN do.)

Documentation

No matter how good a product's features, it can be difficult to use without good documentation and support. The manuals from Oki and Micom provide extensive insight into their respective architectures, adherence to standards, technology used, network planning and more. Oki goes to great lengths to cover diagnostics, network planning, QoS and technology limitations. Oki's manuals suffer a little from inelegant translation from Japanese but are organized the best — comprehensive in scope and attentive to detail.

Inter-Tel's documentation, on the other hand, is aimed at computer telephony and network engineers and technicians, rather than at MIS and IT administrators. Inter-Tel's Vocal'Net manuals are thorough, detailed and clear for installation and setup tasks. We were overjoyed at the extensive coverage of phone, central office and PBX integration options. However, we would have liked more detail on technology behind the scenes and philosophy of operation.

The NeTruePhone documentation is limited; we read the entire manual in 10 minutes. It offers inadequate phone system integration information and virtually no product background.

Installation and setup

Oki's Internet Voice Gateway was the easiest of the four products to install and fire up. The entire unit is built into a small case that can fit into a briefcase. Setting up and connecting lines and settings takes about 15 minutes.

The NeTruePhone is also easy to install. The thin manual briefly covers assembling a system, but the boxes we received were all ready to go. Connecting cables is a bit tricky. Without the knowledge of what a Dialogic Corp. voice card is, you would have a hard time trying to guess where to plug in the telephone lines and where to put the network cables.

Also strange is the requirement to hard-code a specific Internet routable IP address into the system prior to shipping, presumably to protect the system against unauthorized use. This makes the system more suitable for service providers rather than corporations, which might prefer a system that was not bound to a legal InterNIC-allocated IP network ID.

Micom's V/IP gateway relies on proprietary

Net Results

NetworkWorld Blue Ribbon	**Internet Voice Gateway BS1200** *Oki Network Technologies* *(408) 737-6383* *www.okint.com/html/IVoice Gateway.html* $7,395 for 4 analog channels	**Vocal'Net** *Inter-Tel, Inc.* *(800) 669-5858* *www.inter-tel.com/about/vocal-net.html* $19,000 for 8 analog channels	**V/IP** *Micom, a Nortel division* *(800) 642-6687,* *(805) 583-8600* *www.micom.com/product/VIP_overview.html* $1,200 per board	**NeTruePhone** *NeTrue Communications, Inc.* *(714) 870-0861* *www.netrue.com/netrueph.htm* $21,750 for 8 analog channels
PROS	▲ Small and easy to install. ▲ DNS integration.	▲ Good phone system and PSTN integration.	▲ Single board system makes implementation simple.	▲ Highly scalable.
CONS	▼ Serial-line command-based interface not as easy to use as server-based products with a GUI.	▼ Time-consuming to set up.	▼ Windows 95 platform limits scalability.	▼ Poor documentation.

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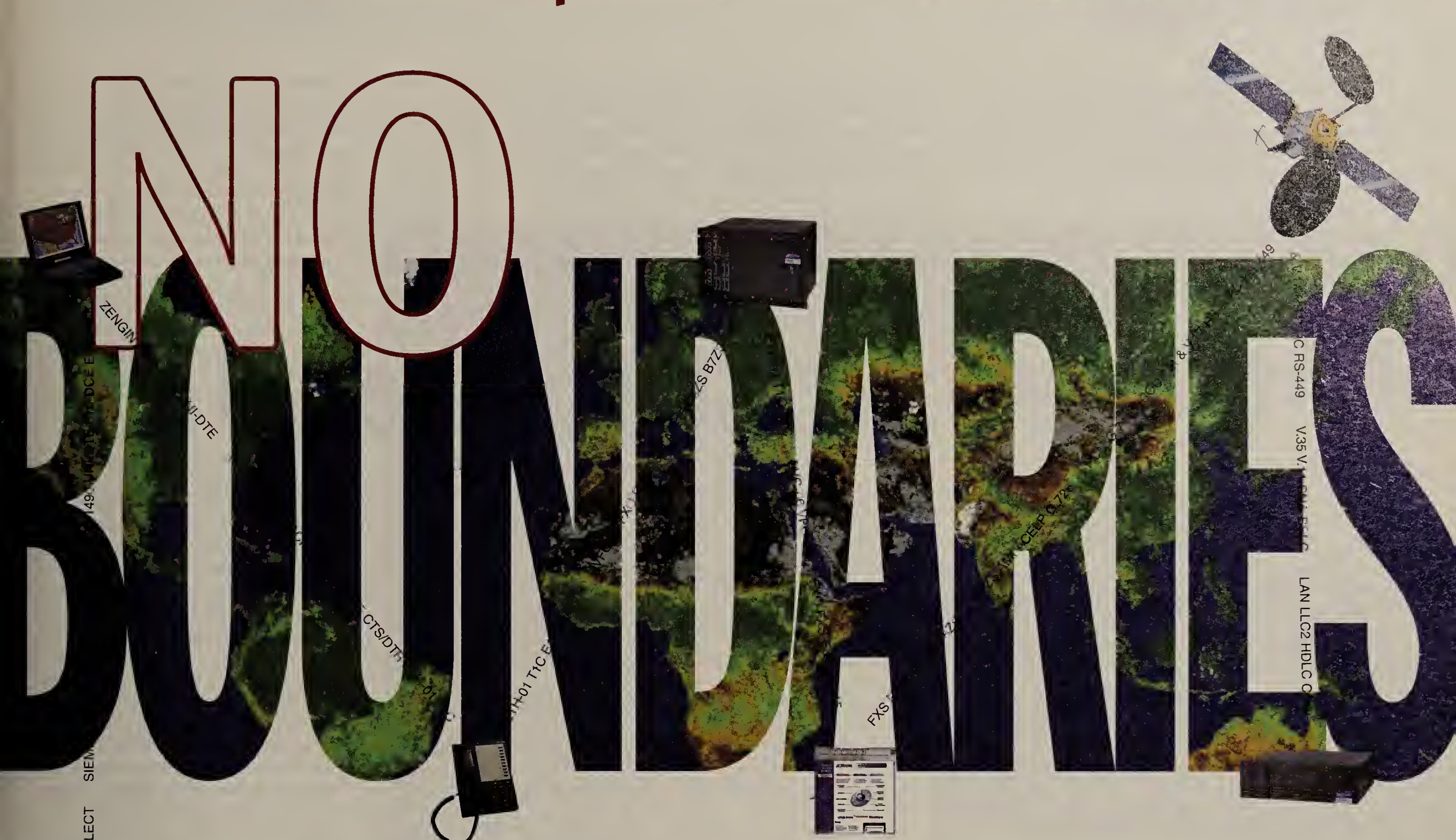
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*ACT's U.A.A. product line includes its award-winning NetPerformer Integrated Access and SkyFrame Satellite over Frame Relay products as well as its newly-introduced ServiceXchange IP Telephone Gateway Products.

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Circle Reader Service #9

adapter cards that plug in to any Windows 95 machine. The whole effort is not unlike setting up a sophisticated modem or fax card. There are various DIP switches and settings with which to play. We spent a solid day on the setup of the product.

But Inter-Tel's Vocal'Net is the most time-consuming to set up and install. It comes as a kit that includes two Hewlett-Packard Co. Internet Server machines. Software setup and configuration under Windows NT is a lengthy process, as complex as setting up Microsoft Exchange Server or an advanced voice/fax messaging system.

Voice-over-IP technology shows exceptional promise, with solutions ready to be fired up now. Emerging standards, such as Resource Reservation Protocol that can reserve bandwidth for voice communications, and support from heavyweights such as AT&T, will add to the promise. Still, we have a long way to go before the borders of the 'Net and the PSTN become indistinguishable.

Shapiro is president and CEO of TekMatix, Inc., a systems integrator in Coconut Creek, Fla. He is the author of Computer Telephony Strategies, *among other titles. He can be reached at jeffreys@tekmatix.com.*

IP telephony: A cost-effective call

Voice-over-IP gateways are ready to start saving you money, but the current lack of interoperability is a drawback.

By Sim Hall

ISSUES AND TRENDS

Although most network managers have long been familiar with the potential cost benefits of consolidating voice and data, few IP telephony products were ready for deployment in the enterprise.

All that has changed in the past few months, as several vendors began shipping voice-over-IP gateways designed for corporate use.

The recent entry of major network hardware vendors has helped legitimize the nascent IP telephony market. For example, several Cisco Systems, Inc. products now accommodate IP voice cards, eliminating the need for PC-based gateways. Managers can add IP voice capabilities when they upgrade their routers.

Several other vendors offer voice-over-IP gateways that run on Windows NT Pentium-class PCs. These platforms host call-processing software and accommodate voice cards with powerful Digital Signal Processors for rapid analog/digital conversions.

A PC-based voice-over-IP gateway typically fits between a PBX or key system and a router. Many gateways rely on the PBX for some functionality, while products from PBX vendors such as Lucent Technologies, Inc. or Nortel tend to be more tightly integrated. Some IP voice gateways can even replace a PBX by providing similar functionality.

Naturally, voice quality should be a top priority. You can't save money if employees won't use the system. Although there is considerable variance among suppliers, most voice-over-IP gateways deliver acceptable voice quality on intranets with only minor network tweaking. However, business-quality voice over the Internet is still a distant goal.

As you'll see in the accompanying Buyer's Guide Chart, prices range from just over $1,000 to hundreds of thousands of dollars, depending on capacity and features.

Ask vendors to give you estimates for the specific configuration you need. Although you may pay more attention to pricing a voice-over-IP gateway with high-capacity, digital interfaces for use in corporate headquarters, the bulk of your IP telephony investment will probably go toward smaller systems with two to eight analog channels for all your branch offices.

Go online for more resources on IP telephony:

- **The Interactive Buyer's Guide lets you search for products that meet the criteria you select**
- **An expanded version of the Buyer's Guide Chart**
- **Internet telephony tutorials, product descriptions, newsgroups and FAQs**
- **Our testing methodology**

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Be sure to also think about a gateway's life-cycle cost. Installation can be relatively complex, and ongoing maintenance expenses are significant. Today, most buyers expect a payback in one year or less. A return on investment is often achievable in just a few months if your company makes lots of international calls.

As the chart indicates, most voice-over-IP gateways supply at least one T-1/E-1 connection to the PBX, while a few also support ISDN lines.

Buyer's checklist

When evaluating Internet telephony products as an alternative to your existing telephone system, ask yourself these five questions:

1. Can a system provide additional dial tone over your existing lines? For example, suppose you have 48 public switched telephone network phones, with at least 12 of the PSTN lines being used for intracompany communications. If you were able to move six channels to your frame relay net or the Internet, that would free up six lines and perhaps obviate the need to install another T-1 line.

2. Can your PBX interoperate with the system without modification? The last thing you need is to create more problems for your telephone system than you solve. PBX systems are still 99.99% closed architecture, so there's no way a PBX can or should be modified or extended to support a gateway. The PBX or telephone system should see no difference between the digital or analog phone jacks coming out of the gateway you buy and the feed coming from the central office or tie line.

3. Can the system support computer telephony services (such as voice mail, interactive voice response and fax-back) without add-ons or modifications to either side, such as digit repeating or amplification technology? If a corporate user tries to reach a voice messaging server in a remote location, will the route over the IP network support interactive technologies that use in-band dual-tone multifrequency signaling?

4. Does the technology save you money, and can you show your return on investment? Routing calls over the Internet, or a corporate intranet, does save money. Someday, however, calls over the Internet may be taxed or subject to tariffs.

5. Can you use the technology to soak up an oversupply of private bandwidth? In other words, if you maintain a wide-area data network that is loaded doing data interchange during the night, can you use it for voice communications during the day? Companies with multiple locations linked together via a WAN can benefit greatly from the ability to place voice calls over a frame relay IP network that has available bandwidth during business hours.

— Jeffrey Shapiro

The few products in the chart that support analog lines are designed for small offices that only use a few phone lines. Regardless of line type, the majority of voice-over-IP gateways support Ethernet or Fast Ethernet.

While product reliability isn't yet up to traditional telephony standards, many voice-over-IP gateways provide some level of redundancy. For instance, nine products in the Buyer's Guide offer backup power supplies, several feature hot-swappable gateways and/or cards, and a few provide redundant disk drives.

More than half of the gateways also feature automatic public switched telephone network fallback. The very need for such phone network backup highlights the comparative frailty of IP telephony systems.

All vendors offer remote management of multiple gateways from a central location. Because remote sites often lack appropriate technical expertise, this capability merits close examination. Remote diagnostic testing and error-logging capabilities are other important requirements.

Look for ease of use and automation as well as comprehensive management capabilities. For example, automatic updating of phone directories throughout the network greatly simplifies the ongoing administration of changes in users and sites. Consider choosing a product with support for SNMP, which is emerging as a de facto standard to facilitate interoperability with other network management systems and devices.

Thorough and clear documentation is a must, and online help features are a plus. Graphical user interfaces are helpful.

Most voice-over-IP gateways support several compression schemes, such as G. 711 and G. 729. A selection of choices lets you tailor compression to meet your unique network conditions and performance requirements. Support for International Telecommunication Union standard compression methods will eventually help vendors' equipment operate with their competitors. On the other hand, proprietary methods can provide important performance advantages.

For now, you'll need to buy your entire IP telephony system from a single supplier. Although standards work is steadily progressing, it will be some time before you can confidently mix voice-over-IP gateways from multiple vendors. In addition to voice compression and call setup, common approaches are needed for such critical features as numbering, remote configuration and fault diagnosis.

To diminish some of the risk of relying on a single vendor, favor vendors that have made commitments to implementing standards such as the International Multimedia Teleconferencing Consortium's recently approved Version 1.0 voice-over-IP interoperability implementation agreement. But formal conformance testing and certification processes are still lacking, so you'll need to rely on informal testing between individual suppliers.

Hall is the vice president of research at telecom consultancy Action Information Services and the principal author of a comprehensive Internet telephony market study. He can be reached at shall@actioninfo.com.

Directed
and presented by
Ray Horak,
Context Corp.

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Technologies and Their Practical Application

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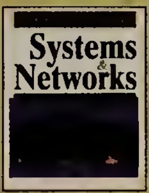

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1. Gain a comprehensive understanding of networking and data communications today and in the near future.
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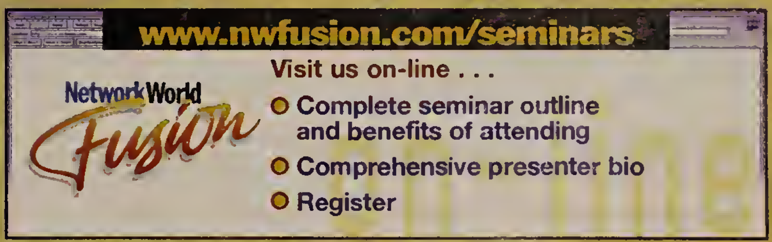
3. Gain a solid understanding of the fundamentals of LANs and LAN internetworking.
4. Learn the basics of data communications protocols: line set-up, coding schemes, asynchronous vs. synchronous, error detection and correction.
5. Understand the evolution of data networking, from DDS and X.25, through T/E-Carrier, ISDN, SMDS, Frame Relay, ATM and B-ISDN.
6. Learn the nature of current and developing infrastructure technologies, including xDSL (ADSL, HDSL, IDSL and SDSL), Wireless Local Loop (WLL), hybrid local loops and SONET.
7. Understand the options for wireless data networking in the LAN, MAN and WAN domains.



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PRODUCT CHART: VOICE-OVER-IP GATEWAYS

Company	Product	Configuration												IP Communication					
		Gateway type	Number of concurrent voice calls supported per gateway	Number and type of LAN interfaces supported	Number and type of analog voice interfaces	Number of analog channels per card	Number and type of digital voice interfaces	Number of digital chanels per card	Channel can be either voice or fax	Total number of simultaneous fax calls supported	Voice bandwidth requirements per call in K bit/sec	Bandwidth is adjustable	Gateway is designed to work behind a PBX	Telephone-to-telephone	Telephone-to-PC	PC-to-telephone	Real-time fax-to-fax	Store-and-forward IP fax	Dial-up modems
ArelNet, Ltd. 011 972 8 942-0880 www.arelnet.com	**I-Tone**	Turnkey, software/ hardware server bundle	120	2 Ethernet and 1 Fast Ethernet	Up to 30 FXO, FXS or E&M	2, 4, 6, 12 and 16	Up to 4 T-1 or E-1	24 T-1 and 30 E-1	▪	Up to 120	5.3K, 6.4K, 7.3K, 8K, 9.6K and 64K bit/sec	▪	▪	▪		▪	▪	▪	
Array Telecom, Inc. (416) 736-0901 www.voipgate.com	**VOIPgate.com**	Software plus voice cards or a turnkey, software/ hardware server bundle Requirements: Windows NT Min: Pentium, 166 MHz, 32M bytes Max: None	60	1 ATM, Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI or token ring	Up to 2 FXO or FXS	2, 4, 16 and 24	Up to 2 T-1, E-1 or PRI	24 T-1, 32 E-1 and 23 PRI	▪	60	12K bit/sec	▪	▪	▪	▪	▪	▪		▪
Cisco Systems, Inc. (408) 526-4000 www.cisco.com	**AS5300**	Remote access concentrator	60	1 Ethernet and 1 Fast Ethernet	None	N/A	Up to 2 T-1, E-1 or PRI	24 T-1, 30 E-1 and 24 to 30 PRI	▪	60	About 14K bit/sec	▪	▪	▪	▪	▪	▪		▪
Clarent Corp. (630) 637-0448 www.clarent.com	**Clarent Gateway 3.0**	Turnkey, software/ hardware server bundle	120	1 Ethernet or Fast Ethernet	Up to 3 FXS, Loop Start or DID	8	Up to 4 T-1 or E-1	Up to 96 T-1 or up to 120 E-1	▪	96 T-1 and 120 E-1	5.3K, 6.3K, 8K, 9.6K, 32K and 64K bit/sec	▪	▪	▪	▪	▪	▪		▪
Ericsson, Inc. (2) www.ericsson.com/ phonedoubler	**IP Telephony Solution**	Turnkey, software/ hardware server bundle	120	Up to 4 Ethernet, Fast Ethernet or ATM	None	N/A	Up to 4 T-1 or E-1	24 T-1 and 30 E-1	▪	96 T-1 and 120 E-1	Up to 64K bit/sec	▪	▪	▪	▪	▪	▪		▪
Franklin Telecom (800) 372-6556 www.ftel.com	**Tempest Data Voice Gateway**	Turnkey, software/hardware server bundle Requirements: Linux Min: Pentium, 150 MHz, 16 Mbytes Max: None	128	1 Ethernet and Fast Ethernet	Up to 3 FXO or FXS	8	1 proprietary T-1 or E-1	24 T-1 and 32 E-1			6.4K bit/sec	▪	▪	▪	▪	▪	▪	▪	▪
Hypercom Network Systems (800) 577-5501 www.hypercom.com	**IEN 6000**	Router	960	Up to 4 Ethernet or token ring	16 proprietary FXO, FXS or E&M	2 to 4	1 proprietary T-1 or E-1	24 T-1 and 30 E-1	▪	120	10K bit/sec	▪	▪	▪					▪
InnoMedia, Inc. (888) 251-6250 www.innomedia.com	**InfoGate**	Software plus voice cards Requirements: Windows NT Min: Pentium, 90 MHz, 8M bytes Max: None	80	1 ATM, Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI or token ring	4 FXO	4	None	N/A	▪	4	4.3K to 20K bit/sec	▪		▪				▪	
Inter-Tel, Inc. (800) 669-5858 www.inter-tel.com	**Vocal 'Net IP Telephony Gateway**	Software plus voice cards or a turnkey, software/hardware server bundle Requirements: Windows NT Min: Pentium, 133 MHz, 24M bytes Max: Pentium, 200 MHz, 64M bytes	24	1 ATM, Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI or token ring	Up to 4 FXO or FXS	8	1 T-1 or E-1	24 T-1 and 30 E-1	▪	Up to 24	7K to 17K bit/sec		▪	▪					
Linkon Corp. (203) 319-3100 www.linkon.com	**LinkNet**	Turnkey, software/ hardware server bundle	72	Up to 12 ATM, Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI or token ring	Up to 6 FXO, FXS or E&M	4 and 8	Up to 3 T-1 or E-1	24 T-1 and 30 E-1	▪	72	4.8K, 7.2K, 9.6K, 13.3K, 24K, 32K and 64K bit/sec	▪	▪	▪			▪	▪	
Lucent Technologies, Inc. (800) 821-8204 www.lucent.com	**Internet Telephony Server-Enterprise**	Turnkey, software/ hardware server bundle	60	1 Ethernet or Fast Ethernet	8 FXO	4 or 8	Up to 2 T1 or E1	4 to 24 T-1 and 4 to 30 E-1	▪	48 T-1 and 60 E-1	12K to 18K bit/sec	▪	▪	▪	▪	▪	▪		
Micom, a Nortel division (805) 583-8600 www.micom.com	**V/IP Phone/ Fax IP Gateway**	Software plus voice cards Requirements: Windows NT and 95, DOS and NetWare Min: 486 Intel, 25 MHz, 4M bytes Max: None	1 to 30	Ethernet and token ring, limited only by server platform	Up to 3 FXO, FXS or E&M	1 to 2	Up to 2 T-1 or E-1	24 T-1 and 30 E-1	▪	30	0 to 14.8K bit/sec		▪	▪			▪		
Motorola, Inc., Information Systems Group (508) 261-4000 www.motorola.com/networking	**Vanguard**	Router	96	2 Ethernet and 2 token ring	Up to 8 FXO, FXS or E&M	2	1 T-1 or E-1	24 T-1 and 28 E-1	▪	28	5.3K, 8K and 16K bit/sec	▪	▪	▪	▪	▪	▪		

Products highlighted in color were tested. Blue Ribbon winner. (1) Digital Channels only. (2) Business is conducted via the World Wide Web. N/A = Not applicable.

Compression			Standards	Protocols					Management						Capabilities									Administration				Cost
Compression algorithms	Silence suppression	Forward error correction	H.323 standards	Supports or plans to support Enterprise Computer Telephony Forum H.100	RSVP	Signaling System 7 (SS7)	Least Cost Routing (LCR)	Real-time Transport Protocol (RTP)	Call management	Route prioritization	Call tracking	SNMP	Fault tolerance and/or redundancy features	Automatic Least Cost Routing function	Audio conferencing	Supports TAPI 3.0	Gateway monitors/manages line quality	Interactive Voice Response (IVR)	Dynamic database directory service	Internet call waiting	Internet direct dial	Off-net dialing (placing calls to the PSTN)	Automatic fallback to PSTN (if IP setup problems occur)	Program access via APIs	Central management of multiple gateways	Call billing/accounting	Reporting	Total price
G.711, G.723A, G.729.1, SX7300 and SX9600	■	■	H.225 and H.245		■		■	■	■	■	■	■	Hot-swappable gateways, RAID 5 storage and redundant CPU, hard drive, power supply and backplane	■		■	■	■	■		■	■	■	■	■	■	■	$14,750 to $100,000
G.723.1, SX7300P and proprietary	■	■	All H.323 Version 2			■	■	■	■	■	■		PSTN fallback call routing and secondary gateway automatic fallback	■			■	■	■			■	■		■	■	■	$7,000 to $45,600
G.729	■		H.323 Version 1		■		■	■	■	■	■	■	Rack and Stack N+1	■			■	■			■	■			■	■	■	$14,400 to $33,000
G.711, G.723.1 and G.729	■	■	None	■		■		■	■	■	■	■	Redundant power and fan				■	■	■		■	■	■	■	■	■	■	$4,000 to $180,000
G.711, G.723.1, G.729, G.729A and GSM full rate and GSM EFR	■		Tiphon Profile: H.261, H.263, G.711, G.723.1, G.729, G729a, H.225.0, H.323 and T.120	■			■	■	■	■	■	■	Hot-swappable cards and automatic failover	■	■		■	■		■	■	■	■	■	■	■		$24,000 to $200,000
G.723 and G.729	■		Q.931, H.245, G.723 and RTP (RFC, 1889)	■			■	■	■	■	■		Entire gateway is hot swappable	■			■	■	■		■	■	■		■	■	■	$14,450 to $28,370
G.711, G.723.1, G.726, G.727, G.729A and proprietary	■		H.225.0 and H.245				■	■	■	■	■	■	Redundant power supplies, parallel processors and bus architecture	■	■		■					■			■	■	■	$39,400
G.729 and proprietary	■		H.265, H.225, H.245, RAS, Q931, RTP and RTCP	■			■	■	■		■		Server platform dependent	■			■	■	■			■			■	■	■	$2,495 to $2,995
GSM			None							■		■	Redundant power supply and hard drive					■	■						■	■	■	$8,000 to $38,000
G.711, GSM, ADPCM, Sub-Band Coder and CELP	■	■	None	■		■	■		■	■	■	■	Automatic failover of entire gateway and ports, automatic call and network rerouting and automatic red/yellow alarming	■			■	■				■	■	■	■	■	■	$5,995 to $72,000
G.723.1, SX7300P, SX9600 and proprietary	■	■	All H.323 Version 1				■				■	■	RAID 5 storage, Compaq Insight Manager and PSTN fallback	■			■				■	■	■		■			$20,000 to $70,000
ITU G.729 and CS-ACELP	■	■	None		■			■	■		■	■	None	■			■					■		■	■		■	$1,050 to $2,995
G.723.1 and proprietary	■	■	H225, H.245, G723.1 RTP and UDP	■				■	■			■	Redundant power supply									■	■		■		■	$2,000 to $20,000

CHART COMPILED BY SUZANNE GASPAR

PRODUCT CHART: VOICE-OVER-IP GATEWAYS

Company	Product	Configuration												IP Communication					
		Gateway type	Number of concurrent voice calls supported per gateway	Number and type of LAN interfaces supported	Number and type of analog voice interfaces	Number of analog channels per card	Number and type of digital voice interfaces	Number of digital channels per card	Channel can be either voice or fax	Total number of simultaneous fax calls supported	Voice bandwidth requirements per call in K bit/sec	Bandwidth is adjustable	Gateway is designed to work behind a PBX	Telephone-to-telephone	Telephone-to-PC	PC-to-telephone	Real-time fax-to-fax	Store-and-forward IP fax	Dial-up modems
NETPBX Corp (818) 889-2555 www.netpbx.com	**NETPBX Internet Telephony Gateway**	Turnkey, software/ hardware server bundle	24	1 Ethernet	1 FXO	4	None	N/A			2.4K, 3.6K, 4.8K and 9.6K bit/sec	•	•	•					
Netrix Corp. (800) 366-4665 www.netrix.com	**Network Exchange**	Turnkey, software/ hardware server bundle	210	Up to 4 Ethernet or Fast Ethernet	1 to 7 proprietary FXO, FXS or E&M	4	Up to 7 proprietary T-1 and up to 6 proprietary E-1	24 T-1 and 30 E-1	•	210	6.4K bit/sec	•	•	•			•		
NeTrue Communications, Inc. (714) 870-0861 www.netrue.com	**NeTruePhone**	Turnkey, software/ hardware server bundle	192 T-1 and 240 E-1	1 ATM or Ethernet	Up to 3 E&M, Loop Start or Ground Start	4 and 16	Up to 4 T-1, E-1, PRI or BRI	24 T-1, PRI and BRI and 30 E-1	•	24 to 30	8.6K to10K bit/sec	•	•	•	•	•	•	•	
NetSpeak Corp (561) 998-8700 www.netspeak.com	**WebPhone Gateway eXchange**	Turnkey, software/ hardware server bundle	96 T-1 and 112 E-1	1 Fast Ethernet	Up to 4 FXO	24	Up to 4 T-1 or E-1	24 T-1 and 28 E-1			13.0K bit/sec		•	•	•	•			
Nuera Communications, Inc. (800) 966-8372 www.nuera.com	**F200ip**	Turnkey, software/ hardware server bundle	30	1 Ethernet	Up to 8 FXO, FXS or E&M	1	1 T-1 or E-1	24 T-1 and 30 E-1	•	30	4.8K, 7.47K, 8K, 9.6K, 16K and 32K bit/sec	•	•	•			•		•
Oki Network Technologies (408) 737-6383 www.okint.com	**Internet Voice Gateway BS1200**	Turnkey, software/ hardware server bundle	4	1 Ethernet	Up to 4 FXS or E&M	4	None	N/A	•	1	8K bit/sec		•	•			•		•
Phonet Communication, Ltd. (408) 453-6000 www.phonet.net	**EtherGate**	Software plus voice cards Requirements: Windows NT and 95 Min: Pentium, 133 MHz, 16M bytes Max: None	16 per PC	ATM, Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI and token ring, limited only by server platform	Up to 4 FXO, FXS or E&M	4	None	N/A	•	16 per PC	5.3K to 8K bit/sec	•	•	•	•	•	•		
Siemens Business Communications Systems (408) 492-2000 www.siemenscom.com	**Hicom Xpress Telephony Internet Server**	Turnkey, software/ hardware server bundle	96	1 Ethernet or Fast Ethernet	Up to 4 E&M, Loop Start or Ground Start	4	Up to 4 T-1, E-1 and PRI or 8 BRI	24 T-1, 30 E-1, 23 PRI and 16 BRI	•	60	7.3K to 64 bit/sec	•	•	•	•	•	•		
SkyWave, Inc. (408) 245-1771 www.skywave.net	**SkyGate 98**	Software plus voice cards or a turnkey, software/ hardware server bundle Requirements: Windows NT Min: Pentium, 200 MHz, 64M bytes Max: None	48 T-1 and 60 E-1	Up to 2 Ethernet or Fast Ethernet	Up to 3 FXO, FXS or E&M	8	Up to 2 T-1, E-1 or PRI	24 T-1, 30 E-1 and 23 PRI	•	48 T-1 and 60 E-1	6.3K and 8K bit/sec	•	•	•			•		
Speedcom International Corp. (800) 721-9283 www.speedlan.com	**SpeedVoice Telephony Gateway**	Turnkey, software/ hardware server bundle	96	2 Ethernet and Fast Ethernet	Up to 12 FXO, FXS or E&M	4	Up to 4 T-1 or E-1	8 to 96 T-1 and 8 to 120 E-1	• (1)	96	3K to 10K bit/sec	•	•	•					
StarVox, Inc. (408) 383-9900 www.starvox.com	**StarGate Server**	Turnkey, software/ hardware server bundle	Up to 240	Up to 6 Ethernet or Fast Ethernet	Up to 8 FXO, FXS or E&M	1	Up to 10 T-1 or E-1	24 T-1 and 30 E-1	•	48 T-1 and 60 E-1	6.3K to 64K bit/sec	•	•	•	•	•	•	•	•
Vienna Systems Corp. (613) 591-3219 www.viennasys.com	**Vienna IP Telephony Gateway**	Turnkey, software/ hardware server bundle	96	1 Ethernet and Fast Ethernet	None	N/A	Up to 3 proprietary BRI, T-1 or E-1 PRI	8 BRI, 48 T-1 and 60 E-1 PRI	•	24	11K to 30K bit/sec and 64K to 72K bit/sec	•	•	•	•	•	•		
VocalTec Communication, Ltd. (201) 768-9400 www.vocaltec.com	**VocalTec Telephony Gateway 4.0**	Software plus voice cards Requirements: Windows NT Min: Pentium, 233 MHz, 128M bytes Max: None	120	Up to 4 ATM, , Ethernet, Fast Gigabit Ethernet, FDDI or token ring	Up to 2 E&M and up to 2 Loop Start	1 to 8	Up to 4 T-1, E-1, PRI and BRI	24 to 96 T-1, 30 E-1, up to 92 PRI and up to 23 BRI	•	120	4K to 20K bit/sec	•	•	•	•	•	•		•

Products highlighted in color were tested. Blue Ribbon winner. (1) Digital Channels only. (2) Business is conducted via the World Wide Web. N/A = Not applicable.

Compression			Standards	Protocols					Management						Capabilities									Administration				Cost
Compression algorithms	Silence suppression	Forward error correction	H.323 standards	Supports or plans to support Enterprise Computer Telephony Forum H.100	RSVP	Signaling System 7 (SS7)	Least Cost Routing (LCR)	Real-time Transport Protocol (RTP)	Call management	Route prioritization	Call tracking	SNMP	Fault tolerance and/or redundancy features	Automatic Least Cost Routing function	Audio conferencing	Supports TAPI 3.0	Gateway monitors/manages line quality	Interactive Voice Response (IVR)	Dynamic database directory service	Internet call waiting	Internet direct dial	Off-net dialing (placing calls to the PSTN)	Automatic fallback to PSTN (if IP setup problems occur)	Program access via APIs	Central management of multiple gateways	Call billing/accounting	Reporting	Total price
AMBE	▪		None					▪	▪		▪		Automated call redirection and call overflow	▪			▪	▪	▪		▪	▪			▪	▪		$8.995 to $19,995
G.723.1, G.729 annex and proprietary (including 5.5K bit/sec ACELP)	▪	▪	H.225.0 and H.323 Version 2, Q931 and H.245 Version 4	▪			▪		▪	▪	▪	▪	Multiple shelf redundant system with database sharing, call detail records backup and system reroute around network failure	▪	▪		▪	▪	▪			▪	▪	▪	▪	▪	▪	$3,500 to $65,000
G.711, G.723.1, G.729A and GSM	▪	▪	H.221, H.225.0, H.242, H.245, H.323, G.931 and Q.931	▪	▪	▪	▪	▪	▪	▪	▪	▪	None	▪			▪	▪	▪		▪	▪	▪	▪	▪	▪	▪	$21,750 to $86,750
GSM	▪		None			▪	▪		▪	▪	▪		None	▪				▪			▪	▪		▪	▪	▪	▪	$47,690 to $197,190
G.711E-CELP at 4.8K, 7.4K, 9.6K bit/sec, G.726, G.728, G.729 and proprietary	▪	▪	H.225, H.245, H.323, Q.931, G.723.1 and RFC 1889	▪			▪	▪	▪	▪	▪	▪	Automatic call rerouting	▪			▪					▪	▪	▪	▪	▪	▪	$4,395 to $30,000
G.729		▪	None						▪			▪	Automatic call rerouting and solid state box									▪			▪		▪	$7,395
G.711, G.723.1 and G.729A	▪	▪	H.323 Version 2	▪	▪			▪	▪	▪	▪		Automatic failover of gatekeeper		▪	▪	▪	▪	▪			▪	▪	▪	▪	▪	▪	$2,400 to $9,600
G.711, 7.3K bit/sec and proprietary	▪	▪	H.225, H.245, G.711, T.120, RTP and RTCP				▪	▪	▪	▪	▪		Redundant power supply, RAID support and fully redundant servers	▪	▪		▪	▪	▪		▪	▪	▪	▪	▪	▪	▪	$25,000 to $70,000
G.723.1 and G.729A	▪	▪	G.729A	▪			▪		▪	▪	▪	▪	Hot-swappable PC chassis	▪			▪	▪	▪			▪	▪	▪	▪	▪	▪	$14,500 to $73,000
G.726, G729A, GSM and proprietary	▪		H.245	▪					▪	▪	▪	▪	Hot standby digital voice cards, split backplane automatic failover, automatic failover CPU cards and redundant power supplies				▪	▪	▪		▪	▪	▪ (1)	▪	▪		▪	$9,000 to $27,000
G.711, G.723.1, G.729A, SX7300 and GSM	▪		H.225, H.245, G.723.1, G.729, RTP and RTCP	▪	▪		▪	▪	▪	▪	▪	▪	Automatic fallback to PSTN during a call and automatic failsafe routing	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪		▪	▪	▪	$10,000 to $425,000
G.711 and Elemedia 7.3K bit/sec	▪	▪	G.711				▪		▪	▪	▪		Redundant power supplies	▪	▪	▪		▪	▪		▪	▪	▪	▪	▪	▪	▪	$18,000 to $55,000
G.723A, GSM, True Speech and proprietary	▪	▪	Full H.323 Version 2 and partial H.323 Version 3	▪			▪	▪	▪	▪	▪	▪	Data replication and automatic failover of gateway, board, power supply and CPU	▪	▪		▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	$23,500

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And the winner is...

John W. Miller
Computer Director
Northland Baptist Bible College

"Good morning, Mr. Miller." The registrar's secretary seemed unusually cheerful. "The network seems to be running much faster this morning." Her words were music to my ears. Actually, with the changes I'd made, I had expected such a reaction. A month earlier we had decided that our coax-based ARCnet network would no longer meet our college's growing needs. The decision was not made lightly as we would need to replace all of our coax cable with plenum-rated CAT-5 10BASE-T cable.

Our goal was to make the entire changeover during spring break. To ensure compatibility, I had decided to use only one brand of network equipment. 3Com had the best products for our campus technology needs.

We had about 80 computers on our network, so I purchased four SuperStack II hubs, one management module, connecting cables, and 100 EtherLink III network cards. I stacked the hubs, essentially putting 96 ports on one segment. This solution was plug-and-play, with identical setups on all the computers. My part-time crew had the computers converted to Ethernet in three days, and the cabling and new server installation each took three days.

I really didn't want more than 24 nodes on any segment, so I knew I'd need more 3Com products. I opted for the LinkSwitch 1000 and a 100-Mbps 3Com network interface card for the server. I placed the LinkSwitch at the backbone, giving a dedicated 10-Mbps pipeline to each SuperStack hub. I decreased collisions and increased throughput by giving each network printer a port on the LinkSwitch. It was this configuration that prompted the cheerful Monday morning greeting, and reaffirmed the wisdom of purchasing the best products on the market.

Since that time our network has grown to over 250 computers. I have always chosen 3Com network interface cards and 3Com hubs to meet the demands of our growing network and I have never been disappointed.

Congratulations, John!
Your story won the contest's grand prize of $10,000 worth of 3Com equipment, plus $500 in cash.

Management Strategies

Ousted by outsourcing

Follow these five tips for devising a game plan if your company has outsourced an IT project.

By Rivka Tadjer

Dion Brooks had to take a couple of days off to attend his grandfather's funeral. When he came back to his desk at work, someone else was sitting there. He found out the hard way — his job as an Internet administrator for a firewall manufacturer had been outsourced.

"To this day, I don't know why they decided to outsource the Internet operation," says Brooks, who now owns BGB Consulting, a network consultancy in Arlington, Texas. "Not only did no one ever feel the need to explain it to me, but I question the ethics of waiting until I was away to make the switch."

Unfortunately, Brooks' story is not unusual. There are far too many anecdotes about network administrators who have had the rug pulled out from under them and never knew why.

The most common problem IT professionals face today is being ousted from their jobs by consultants, according to human resources executives. It's very tempting for upper management to compartmentalize a messy project and hand it off to someone else.

"Outsourcing is . . . so demoralizing for loyal employees," says Peg Toomey, director of human resources at New York-based SuperNova, Inc., a software development company. A 20-year human resources veteran, Toomey specializes in IT hiring for many industries.

If your employer outsources an IT project you were responsible for, the situation may seem bleak. But short of starting your own company, there are a few strategies worth trying.

After Dion Brooks *learned his Internet administration job was outsourced, he started his own network consulting company on a much more pleasant note.*

PAUL BUCK

Get information

If you find yourself faced with a new boss as a result of outsourcing, do not storm into your old boss' office — yet. First, you need information. Find out what kind of skills the new boss has, and honestly assess how you measure up. Never run to complain to the higher-ups before you have this information, or you're likely to make a fool of yourself.

Get some training

By outsourcing, your company is admitting it needs new skills. Get the training you need to diversify your skill set, and make yourself more marketable. Perhaps your boss is even willing to foot the bill.

Ask your manager to invest in the company by investing in you as an employee, one of its assets. It's hard for employers to resist that kind of initiative and loyalty, says Chandra Patel, CEO of Champs Software in Crystal River, Fla., a client/server network environment developer.

Patel knows of what he speaks — he fired half of his IT staff after he outsourced some major software development. "But I would have paid for training for any of the IT staff who were willing to learn new things," he says. "In my case, many on the IT staff just got mad. But the ones who went to training are still here."

If the executives won't send you to training, you probably don't want to work for them anyway.

Befriend the new boss

Even if you've already begun circulating your resume, it may take a while to find a job you like. In the meantime, it can't hurt to offer your new boss a helping hand. You may be able to gain some leverage, earn a good reference or even land responsibility for part of a project. In Brooks' case, his new boss knew nothing about the Internet. Perhaps he could have won back his decision-making power or been given other projects to run.

Quietly put your resume out

Even if you don't want to leave, do this anyway. Go on some job interviews, as well. Job interviews give you perspective that your employer isn't the only game in town. Besides, a job offer from another company may give you good leverage with your present employer. Sometimes employers need a wake-up call.

Another reason to circulate your resume is to prepare yourself for the reality of leaving the company. Sometimes it won't be your choice, so you may as well be proactive. It makes everything less stressful.

Don't just distribute your resume, either. Network with your peers and find out what jobs are out there. Attend trade shows if you can — these are great places to network.

Talk to the powers that be

Say your piece, by all means. Just do it calmly and only after you've befriended the new person. But do it. Focus the conversation on how the outsourcing decision and transition were handled, as much as what was done.

If for no other reason, do it because as a professional you need to command respect. Even if you leave the company, you never know where your former colleagues and managers will end up. Show them that you're a straightforward, well-spoken person with initiative. Plus, it will give you peace of mind.

Tadjer is a freelance writer in New York. She can be reached at rivkat@mindspring.com.

Have you ever found yourself ousted by an outsourcer? How did you handle the situation? Go online and access *Network World*'s Management War Stories forum, the place to share your management battles and strategies to enlighten and learn from others' experience.

Get more online:

Find information about outsourcing and the firms mentioned in this story.

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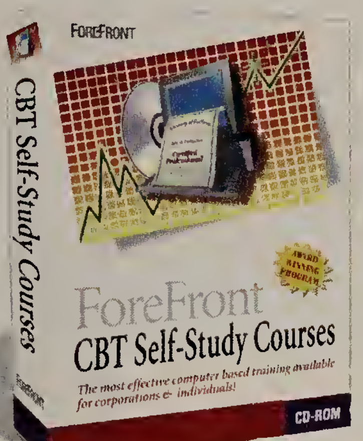
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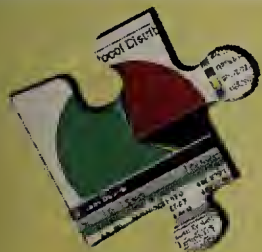

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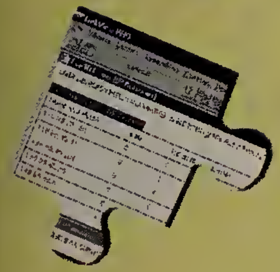

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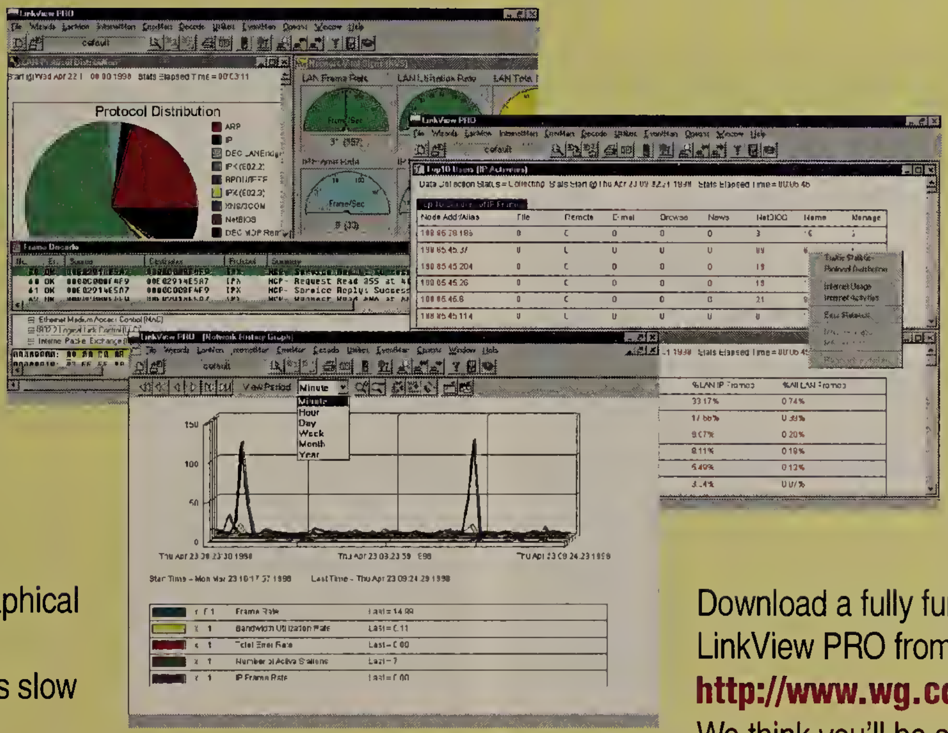

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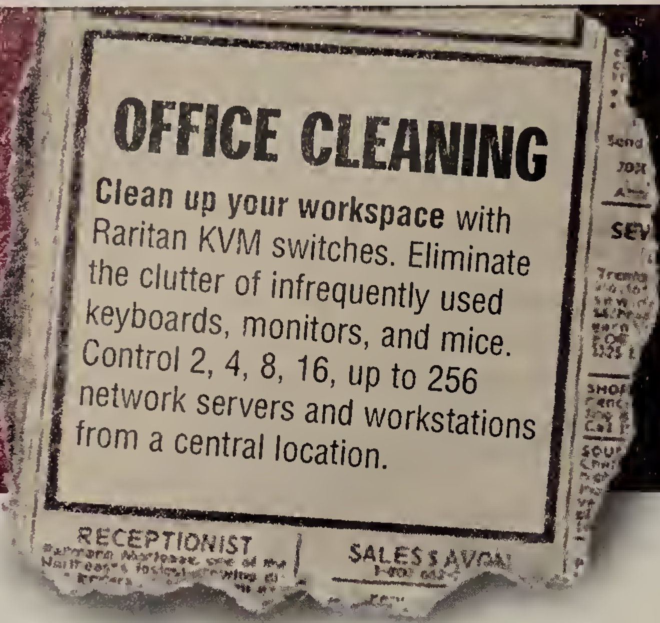
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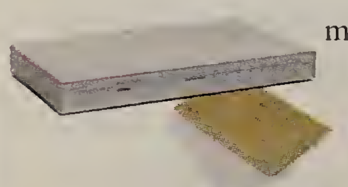

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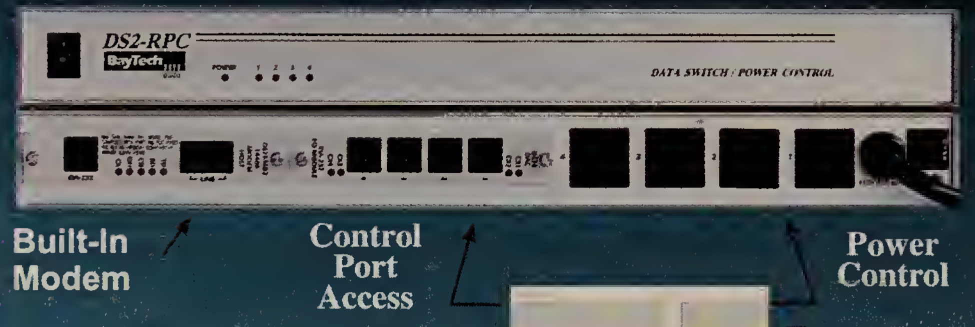

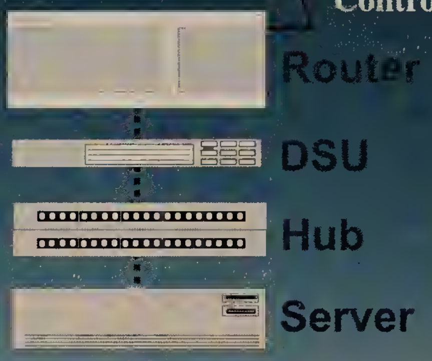

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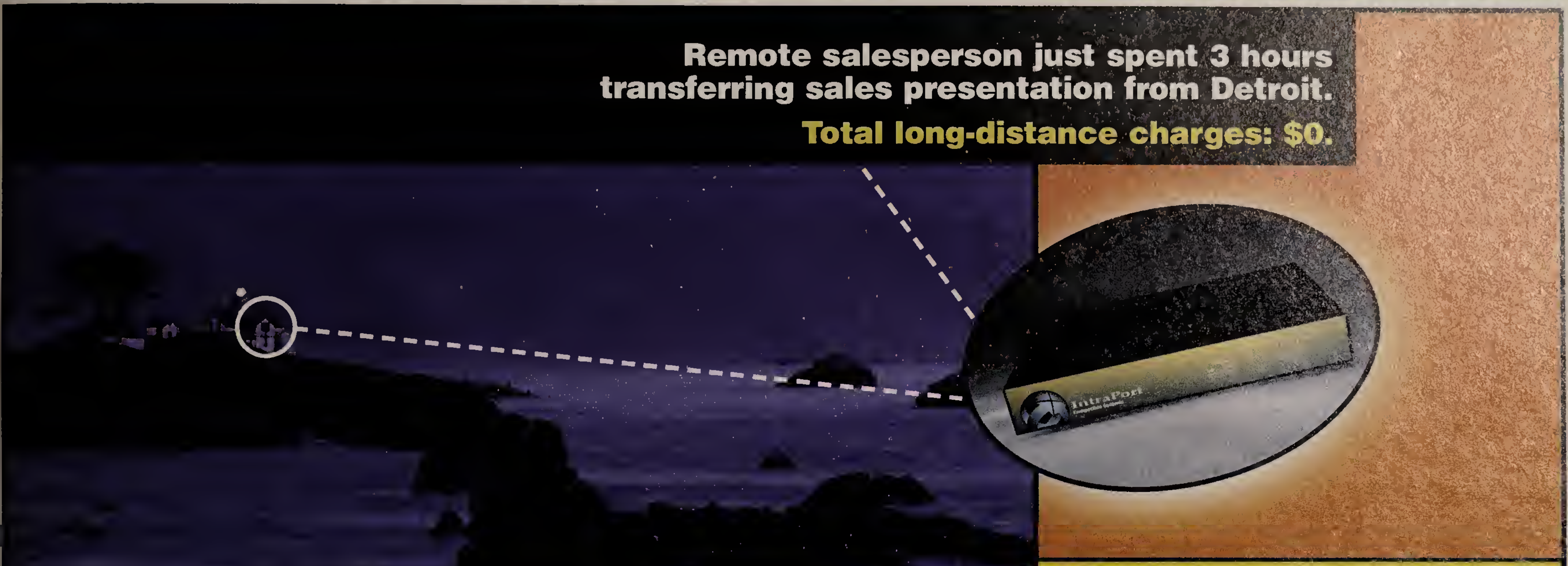

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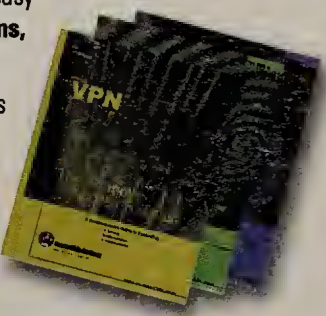

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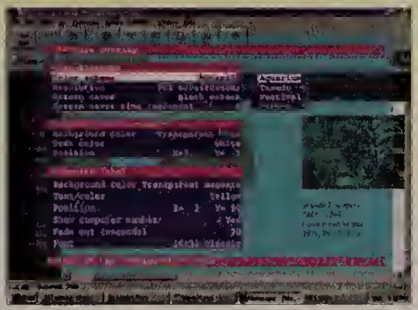

On-screen display menu–This screen shows the overlay menu with the selection for the color scheme popped up.

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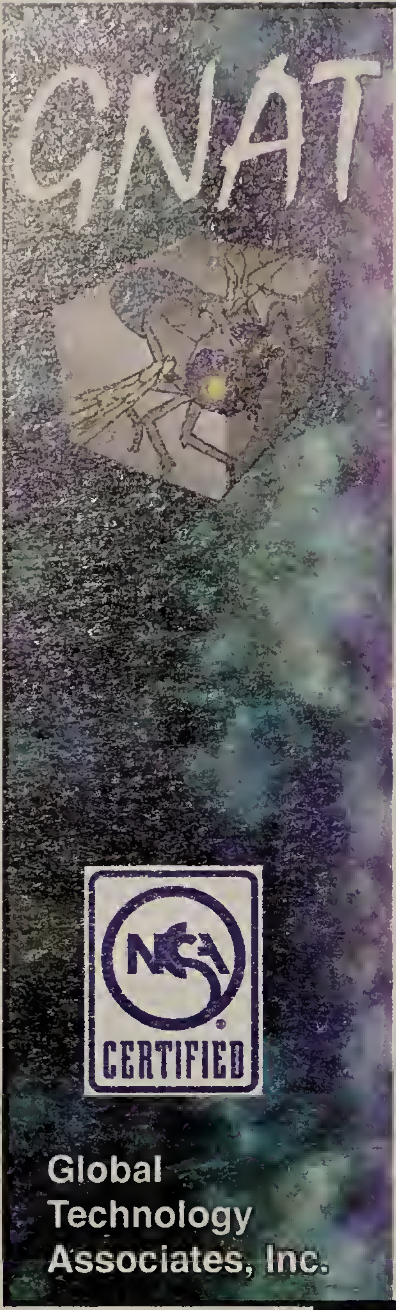

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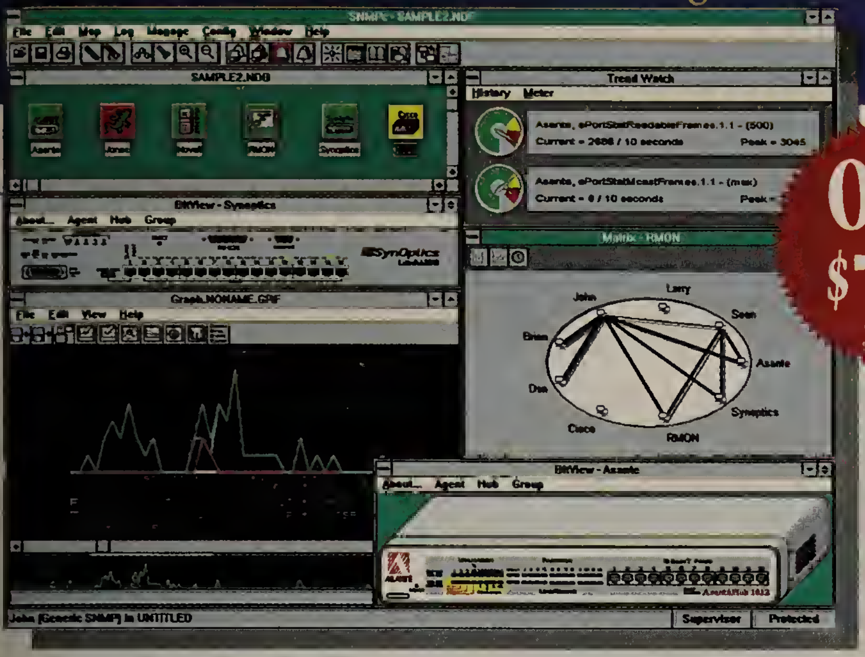

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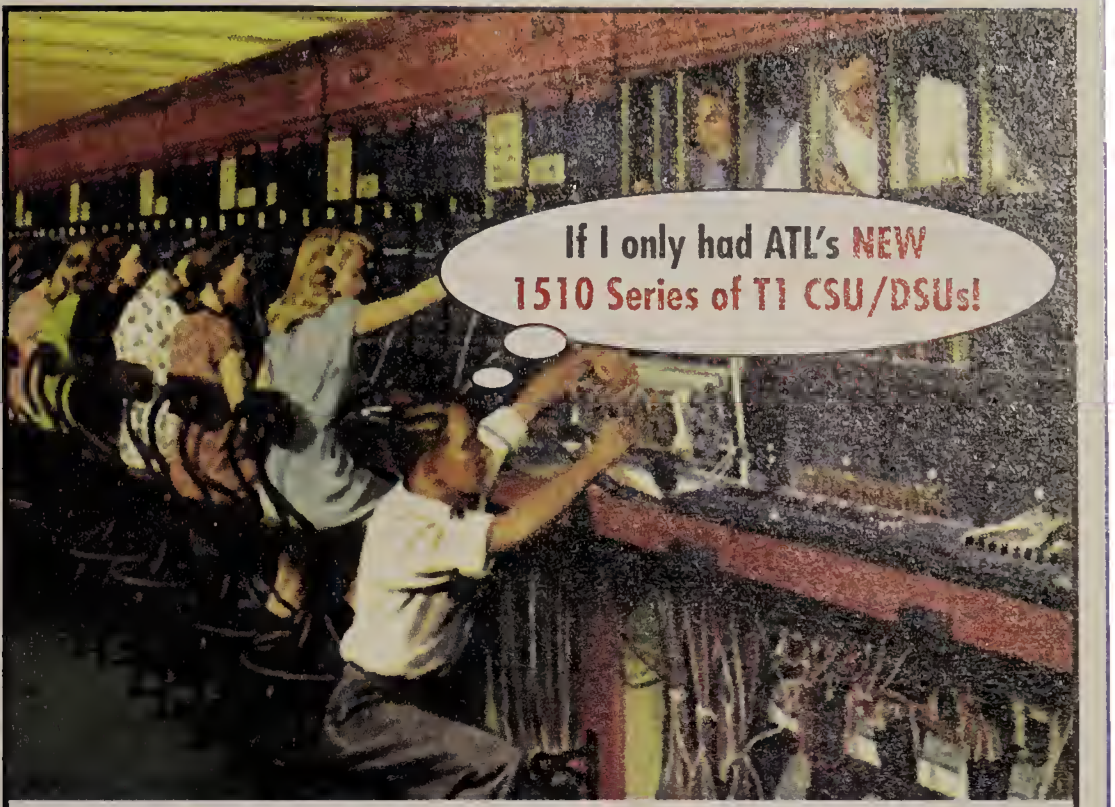
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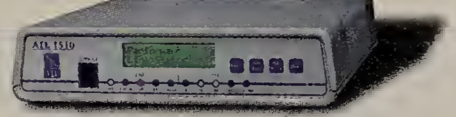

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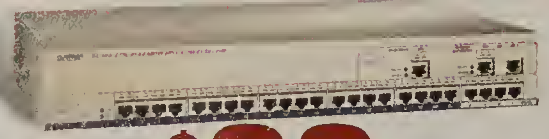

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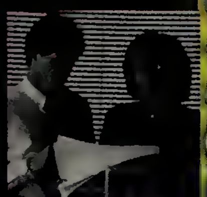

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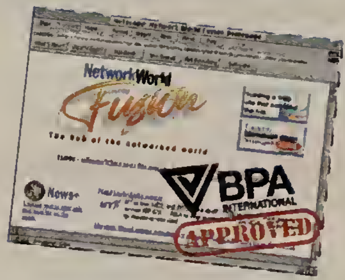

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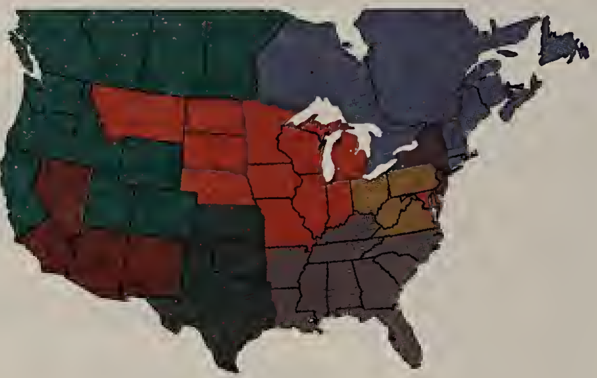

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Year 2000

Continued from page 1

include recommendations for Year 2000 problem remedies, which users say run the gamut from applying simple software patches to replacing older network gear that vendors no longer support.

US WEST took the Web-based service a step further and contracted with Infoliant to bring a customized version of the database behind the phone company's firewall.

"I have 20-some-odd business units and a whole bunch of different areas within my IT organization," Powell said. "This way the information is just there for people, instead of all kinds of individuals having to brute-force things [with Web searches]."

It's not that Infoliant is offering information that is unavailable from other sources. Data Dimensions, Inc. of Bellevue, Wash., offers a similar look-up service, called Interactive Vendor Review. Various government agencies and user groups provide free compliance information databases, although they are limited in scope and detail. And then, of course, product vendors offer information on their own Web sites.

Infoliant's customers said they were impressed by the breadth of products Network Advisor covered and the easy-to-manipulate user interface. Conserving time is a key to meeting Year 2000 compliance goals, customers said.

"I save a good 20 hours a week using [Network Advisor]," said Carrie Garfield, a Year 2000 consultant currently working for an automobile parts manufacturer.

Time is also money for Beal Bank of Dallas, according to MIS director Brian Pierce.

"I've got the [Federal Deposit Insurance Corp.] in here every 90 days saying, 'Are you legal? Are you legal?' " he said. Network Advisor has been "very helpful, very beneficial" in the bank's efforts to keep the regulators at bay, he added.

Do-it-yourselfers will find the going tough on some vendor Web sites, according to Garfield.

"Sometimes we get a [product report] from Microsoft that will say 'compliant with minor issues,' " she said. "Well, you don't know what those minor issues are, but Infoliant will have that information for us.

"Eventually you can find it in the Microsoft knowledge base, but it's a real struggle," she said.

Another difficulty faced by Year 2000 teams is that compliance information can be a moving target. Vendors that offer compliance assurances one day often have to retreat in the face of fresh problem reports or new test data.

"You've got to stay on top of it," said Kevin Weaver, executive vice president at Infoliant. "Cisco has updated [its compliance information] twice in the past week." Infoliant's service offers a compliance-tracking element that notifies clients of such changes, a feature that one industry analyst said could prove invaluable.

"Unless an enterprise can pay security guards to man the home pages of all its suppliers 7-by-24-by-365, this saves time, which equals money savings," said Andy Bochman, senior analyst and Year 2000 specialist with Aberdeen Group, Inc. in Boston.

"Some of the suppliers are updating their Year 2000 info without making much noise about it," Bochman added. "Many of these updates could slip through the cracks of otherwise diligent Year 2000 personnel."

Network Advisor will cost a company $2,795 for up to 200 Web inquiries, with a thousand inquiries costing $4,950.

"I've been at this now since January of '97 and from the get-go I have thought that somebody should be collecting this information," Powell said. "Everybody and their sister is doing this [data searching] all across the country." ■

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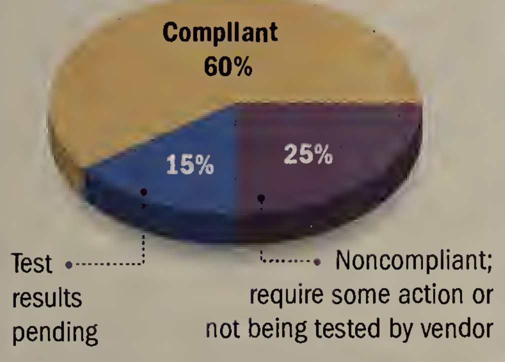
COMPLIANCE SCORECARD

Here's the skinny on the Year 2000 compliance of 15,000 desktop and network products listed in Infoliant's database.



Cabletron

Continued from page 1

Compaq employees have been seen at Cabletron and former Digital plants in the U.S. and in Ireland, where Cabletron has manufacturing facilities.

Compaq's Johnson said his meeting with Benson had nothing to do with an acquisition. "I was talking to Benson about how we move this relationship forward now that it's Compaq and Cabletron, and not Digital and Cabletron," Johnson said.

Industry observers have been wondering whether Compaq would accept the terms of the Cabletron contract. "I'm expecting it to be a relationship that meets the spirit and letter of the contract," Johnson said.

The contract gives Compaq the chance to buy more from Cabletron at cost after the $1 billion in sales. Johnson declined to reveal exact numbers. The deal could also be expanded, Johnson said. Right now, the companies have to agree on what products Compaq will resell, and under what label.

Industry observers are curious about whether Compaq will go for a broad range of products, including older, more established gear, or home in on the newer stuff.

So far, Compaq has agreed to resell three of Cabletron's newest switches: the SmartSwitch 6000 will be sold as the MultiSwitch 700; the SmartSwitch Router will be sold as the GIGASwitch Router; and the SmartSwitch 9500 will be sold as the GIGASwitch 9500, according to Giulio Gianturco, president of worldwide channels for Cabletron.

Whatever devices Compaq decides to resell, the deal could result in Cabletron products carrying the Compaq name, an approach Johnson has advocated. Cabletron apparently agrees, but no decision has been made. The alternative would have the product branded as Digital.

Cabletron is also working with Compaq on reselling the workgroup Ethernet switches from NetVantage under an OEM agreement.

Compaq has not been the only rumored Cabletron suitor of late. An Ericsson, Inc. executive revealed that parent company Telefon Aktiebolaget Lm Ericsson, of Stockholm, Sweden, is shopping for network firms to give it IP switching technology, leading to speculation that Ericsson might be eyeing Cabletron or 3Com Corp.

But Gary Pinkham, vice president of business development and data network solutions for Ericsson, said he wasn't interested in acquiring large, established companies. He prefers "mid-tier and start-up companies — we can make them a global player overnight," he said.

However, Cabletron could be a bargain for any company looking for IP switching. Because the company's stock has hovered around $12 for months, its market cap is substantially lower than 3Com's and Cisco Systems, Inc.'s. An offer of $22 per share would buy Cabletron for about $3.6 billion.

As for all the speculation, a Cabletron spokesman said, "We don't comment on rumors." The spokesman said Benson was meeting with customers and was not available for comment.

While all this was going on, Cabletron last week agreed to swap $100 million in stock to acquire NetVantage, an Ethernet workgroup switch maker that sells its gear under OEM agreement only. On the same day, Cabletron announced revenue of $365.7 million for the first quarter of fiscal 1999. Before $163.6 million in one-time charges related to the acquisition of Yago Systems. Inc., Cabletron reported a profit of $6 million. ■

Cabletron smartens up switches

Cabletron Systems, Inc. later this month will up the price/performance ante for a chassis-based switch when it rolls out a 48-port Ethernet module for the SmartSwitch 6000. The company early next year plans to introduce a 32-slot version of its SmartSwitch Router, a highly praised switch that came from the Yago Systems, Inc. acquisition.

The 6000 module, which will have 48 Ethernet ports, one High Speed Interface Module (HSIM), and optional ATM, Fast Ethernet or Gigabit Ethernet uplinks, will sell for around $100 per port, sources said. The highest density module currently available for the 6000, a five-slot chassis for the wiring closet, has 24 ports.

Some Cabletron customers predicted they would buy the modules as fast as Cabletron shipped them. "It gives us the density that basically nobody else has," said James Wiedel, director of networking at the University of Southern California in Los Angeles. Wiedel said he expects to buy hundreds of modules.

For some, the number of ports may be more important than the price. "Anything I can do to improve port density is welcome," said Roland Voyages, network manager at NationsBanc Capital Markets in New York.

Cabletron is already getting rave reviews for its SmartSwitch Router as well, with a price under $500 per port. The current SmartSwitch Router is selling very well, according to Will Land, director of sales and marketing at InfoSys Services, Inc., a value-added reseller in Maryland. He said different kinds of companies are finding the SmartSwitch Router a good fit. "It will fit into a legacy network with multiple vendors because it is all standards-based," Land said.

The SmartSwitch Router switches 15 million packet/sec, and Cabletron is now shipping an eight-slot chassis. The company will ship a 16-slot chassis later this year and a 32-slot chassis in the first quarter of 1999.

Cabletron can be reached at (603) 332-9400.

— *Robin Schreier Hohman*

Crowe

Continued from page 1

tractual, and legal/regulatory. From a 50,000-foot level, we want to provide users of communications with the best that IP networks have to offer, as well as the best of what traditional circuit-switched networks have to offer. Currently, customers have to manually choose which of those two networks suit their purpose. We think that communications service providers ought to make that choice, a network choice, based on what their customers need.

To burrow down into that, we mean specifically peering or interconnection between IP networks or the Internet and the public switched network signaling systems.

Let's say a customer wants the cost savings associated with IP. Today, given the state of the art, you still have to go through the Bells' telephone network to get to an IP network, and at the other end the odds are high that you will have to go back onto a local phone network, most probably a circuit-switched network. Today, to do that, you have to manually instruct the servers involved about who you are, so there is somebody to bill, and what number you want to call. And that is just the most simple example of what is possible if you interconnect the telephone network to the Internet and to IP networks at the signaling level.

Can you explain the role of the Technical Advisory Council you are spearheading with the hardware and software companies?

It will set the protocols with which hardware and software would implement the interconnections. The goal is to allow every telephone handset — the thinnest of clients, if you will — to access features available on IP networks and the Internet. And to allow any PC to access features available only on the PSTN.

So you are envisioning the kind of interconnection between IP networks and the PSTN that exists today between different telephone company networks.

To start with, yes. But you could envision a future where interconnected [Signaling System 7], IP networks and telephone networks allow a whole new series of services that just aren't possible today, where traffic moves between networks, protocol conversions are done, and data users have access to a whole series of databases that they are blind to today.

I'll give you one example, and for every one example I can think up, entrepreneurs will think up 100 more. But right now, there are kludged services that offer seamless single mailboxes. But with full interconnection, there is no reason at all why you can't do easy, transparent e-mail-to-voice, voice-to-e-mail, text-to-voice, fax-to-e-mail, with the translation all done seamlessly without the kind of baloney you have to go through today.

It strikes me that traditional carriers will have little incentive to cooperate on this type of interconnection.

They don't have a choice. We are not interconnecting with new protocols; we are interconnecting with exactly the same protocols and using exactly the same interfaces and exactly the same interconnection agreements they use today. Any protocol conversions are done on our side of the fence, if you will. From the point of view of any PSTN provider, either local or long-distance, we or anyone else providing IP services would look identical to the kind of interconnections they have with typical circuit-switched providers. So when I talk about an SS7 interconnection, it is a standard, no-deviation-from-the-protocol interconnection.

Is there a reason that none of the carriers were involved with this announcement?

We are interested in moving quickly; we are not interested in any kind of closed system. But, as a generality, I would say the datacom providers and the traditional providers of telecommunications gear that now clearly understand IP is the direction of the future have already made the decision internally that what we are proposing makes sense. We just didn't have time for evangelism among, say, traditional providers. Of course, if anyone comes to us, we'd be happy to respond.

How does this benefit the enterprise customer?

There are a lot of enterprise implications [of IP equal access], even to this first protocol, IP Device Control. Let's start with the simplest: For any enterprise of any size, a direct link between PBX and IP networks is now possible without all of the autodialers and kludged stuff necessary today. And you don't have to build your own IP network; you have a shared service that is less expensive. In the future, there are all kinds of additional possibilities. Plenty of folks are coming up with telephone implementations on LANs. You just plug phones in as one more device, and you have voice service. That allows that kind of implementation to map directly to IP networks and then terminate on the telephone network. That is the key. You are not limited to some kind of intranet voice service. You can get all the cost benefits of that system but have a single network that is IP end-to-end, where that is available but lets you hop seamlessly over to the phone network if you want to call a vendor who is not on your intranet. ■

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- **The full version of our interview with Level 3 CEO James Crowe**

7742

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IP-to-voice ties desperately needed

If you want to make a voice call over an IP network today, you have to dial two phone numbers: one calls the voice/IP gateway that translates voice into packets, the other is the actual phone number.

A group of hardware makers and software vendors called together by upstart carrier Level 3 Communications, Inc. is working on that problem. The answer? Creating a standard way to run voice over IP networks so callers using regular phones can dial just one number.

If the group's work goes according to plan, IP networks could offer single-number voice services as early as January, according to Ike Elliot, senior director of voice network engineering for Level 3. Level 3 has rounded up a group of key vendors to solve the technical problems (see graphic).

With the protocol the group is working on, callers would simply dial the party they want to reach. Gear within the carrier network would translate that information so the IP network could set up the call. The group, called the Technical Advisory Council (TAC), within weeks hopes to present a formal proposal to two standards bodies, the International Telecommunication Union and the Internet Engineering Task Force.

Linking the existing public switched telephone network (PSTN) to the new data networks is key to the success of carriers such as Level 3, said James Crowe, Level 3's CEO.

"This interconnection will allow voice to travel seamlessly between PSTN and IP networks on the basis of a routing algorithm that chooses requisite quality, ubiquity and lowest cost. The kind of IP device control protocol we announced in the TAC is aimed at that," Crowe said.

In addition, the protocol will let providers such as Level 3 dump calls back on the PSTN if their data networks are too crowded at the time. This will ensure that the voice quality will remain high, Crowe said.

New carriers such as Level 3 promise to offer low-cost voice using the proposed technology. They will also offer data services over the same networks. Those networks collapse traditional dual voice/data networks into one network, making for a more streamlined and efficient network.

The protocol the TAC seeks would also give the data network the intelligence to respond as the current voice network does. So, for example, the protocol would be used to trigger ringing or busy signals, or support follow-me phone services.

— Tim Greene

Making voice talk to data

The Technical Advisory Council to IP long-haul carrier Level 3 hopes to set standards for moving traffic between voice and data networks. The following companies are the council's founders:

- 3Com
- Alcatel
- Ascend
- Cisco
- Ericsson
- Level 3
- Lucent
- Nortel
- Selsius
- Stratus
- Tekelec
- Vertical Networks

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Lotus gives knowledge management brain dump

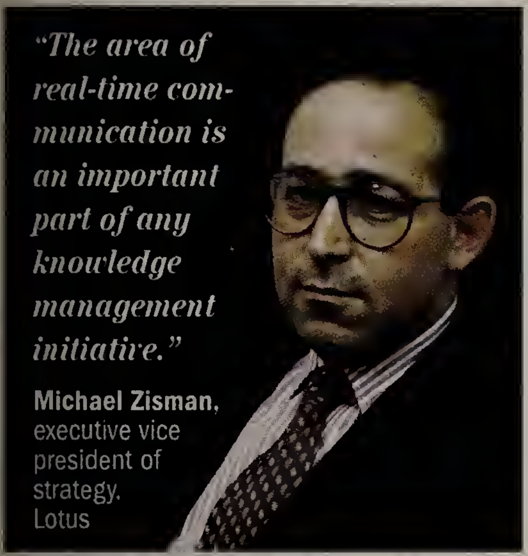
By Paul McNamara

Cambridge, Mass.

Executives at Lotus Development Corp. and parent company IBM last week amplified and clarified their plans for making a splash in the relatively uncharted waters of knowledge management.

"This is one of the rare opportunities where we have a theme that is overarching for both Lotus and IBM," said Michael Zisman, Lotus' executive vice president of strategy.

Industry experts who heard the pitch praised much of the technology as innovative, but also questioned whether corporate IT departments are clamoring for such advanced capabilities.



"The area of real-time communication is an important part of any knowledge management initiative."

Michael Zisman, executive vice president of strategy, Lotus

Central to the Lotus strategy, which first emerged in January at the company's Lotusphere '98 conference, are the following elements:

- A new Domino extended search server, based on IBM technology, will allow users to query across disparate data repositories, such as relational databases, data warehouses, Enterprise Resource Planning applications, Notes databases and the Internet. The product, which will be sold separately from the Domino server, is due later this year.
- Technology Lotus acquired in May when it purchased DataBeam Corp. of Lexington, Ky., and Ubique, an Israeli software maker, will be used in the server. The Notes client itself will also receive real-time features as updated templates for the current version, 4.6. The real-time technology will be built into Notes Version 5.0, due later this year.
- A new LearningSpace Live server will combine Lotus' existing LearningSpace distance learning and corporate training product with DataBeam's LearningServer. The new offering will allow for real-time interaction between instructors and students. It's expected to ship by year-end.

Lotus officials also laid out a framework for future Domino-based tools that will let companies compile "expertise maps." The idea is to give workers fingertip access to a database of information on who knows what within their organization, plus a variety of means by which to contact those individuals.

Industry analysts in attendance gave the game plan mixed reviews.

"It's a CEO-level story, but in real life [knowledge management] is just another tool," said Paula Boyle, an analyst with Kinetic Information of Waltham, Mass. "I don't buy into the whole knowledge management thing, although combining synchronous and asynchronous [collaboration] is very important."

Another analyst echoed the concern about customer appetites for advanced knowledge management capabilities. "Most customers aren't ready for knowledge management at this point," said Eric Brown, an analyst with Forrester Research, Inc. of Cambridge. ■

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PROGRAM OVERVIEW

Virtual Private Networks (VPNs) promise to help build and extend your corporate network by leveraging the global reach of the Internet. Vendors are rushing to incorporate this technology into products ranging from routers to firewalls to remote access servers. Users are now wondering what's involved in deploying and managing VPNs, and how VPNs will be integrated with current network operations.

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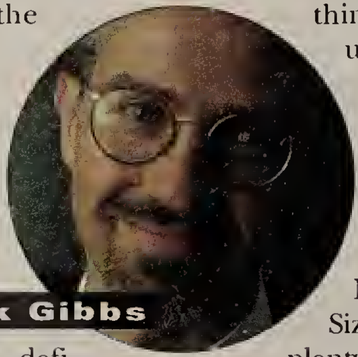
Backspin

Schmidt has steak but little sizzle


Mark Gibbs

It's been just over six months since I fired a broadside at Novell's Eric Schmidt ("IntranetWare sinks. Will Schmidt walk the plank?" Dec. 8, 1997, page 73). I suggested Admiral Schmidt had six months to produce fair seas for Novell or walk the plank, so it is high time to take another look at the seaworthiness of the good ship Novell.

First, there's the share price. It was just over $8 when I wrote the column, slid down to under $7 by the end of January and has since bounced back to $12.75.

This improvement is definitely Schmidt's doing. He is responsible for cost-cutting and general streamlining that is paying off. On the other hand, Novell posted $11 million less in revenue during the second quarter than it did in last year's second quarter, so growth is a problem.

That said, the market apparently likes what Schmidt is doing, and things appear to be going in the right direction. But is it enough? Is this progress sustainable?

In light of the impact Microsoft is having on Novell's marketplace, much will depend on Novell's marketing and ability to develop messages and communicate them.

I was surprised when I read on IDG.net that in his keynote address at PC Expo, Schmidt "put a new spin on the concept that the network is the computer, emphasizing instead that the directory is the computer."

Schmidt is quoted as saying, "It is a directory-centric world, [and the industry must] put the complexity of the PC on the server." He proposes that this be done through directory services, which he calls "NCing your PC."

Eric, Eric, Eric. What are you thinking? Just as the likes of Larry Ellison and Scott McNealy are rewriting history and acting like NCs were never on their minds, you're tying your corporate thinking to this defunct and discredited concept.

This illustrates Novell's problem with marketing. Novell seems unable to find those simple concepts that define the company's position and instead winds up confusing its market.

At the heart of Schmidt's pitch was an interesting idea: Tie users to directory services rather than physical machines. Cool. At least, I think so. As there's no product to show yet, it is hard to say what this will mean in practice.

On the plus side, minor as it may be, Eric has got some sizzle going. And that's what Novell desperately needs: Sizzle. The company's got plenty of steak, but without sizzle the market won't pay attention.

Novell's recent joint announcement with Intel on the topic of an optimized Java virtual machine (JVM) for NetWare was interesting but more of a sizzle precursor. The problem is, we still don't really have a good idea what a NetWare-based JVM will give us.

Sure, there are a few demos that show you can do some stuff, but it's all techie. It's not the kind of stuff that will have you saying, "Wow, that'll make my network easier to run!"

It was the same with the NetWare Web Server. Great product. Fast, elegant, reliable. But useful samples? None. Just more techie stuff.

Novell's good at appealing to developers and the technical community in general, but it is the kind of appeal that Ferraris offer: You'll "oh" and "ah" over the inner workings and the magic of the engineering. But you'll go out and buy a Ford or Hyundai to commute to work and buy the groceries.

So Eric, my advice, for what it's worth: Novell needs to communicate better. You need to tell us why we need NetWare. Sure, some of us know how good NetWare is. If I were putting together a corporate network, I would definitely select NetWare for my file and print servers. No doubt about it. But then I also lust after Ferraris.

Your vehicle choice to nwcolumn@gibbs.com or (800) 622-110, Ext. 7504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

WHERE THE CUSTOMER SHOULD BE KING Here's a quick pop quiz, and no looking at your neighbor's paper.

What is the best way to build your company's business through the Internet?

a) Use the vast reach of the 'Net to target as wide an audience as possible.

b) Put together the coolest Web site around. Include Java, frames and The Dancing Baby.

c) Make it easy for customers to do business with you by streamlining transactional processes.

d) Two words: Spam party.

If you guessed "a," you're wrong. If you guessed "b," we hope you're not in charge of anything. And if you guessed "d," you looked at our paper.

The correct answer, according to well-known computer industry consultant **Patricia Seybold,** is "c": Make it easy for customers to do business with you.

Seybold effectively drives home this seemingly obvious but too often ignored point in a book due out this fall.

"Customers.com: How to Create a Profitable Business Strategy for the Internet and Beyond," is built around case studies of 16 companies Seybold identified as having implemented effective electronic commerce, or "E-Business," strategies.

Among the companies getting stars on their foreheads are **American Airlines, National Semiconductor, Hertz, Amazon.com** and **Cisco.**

These and other companies in her book "all spent the last two to four years investing in initiatives that let their customers do business with them electronically — quickly, easily and cost-effectively," she writes.

Seybold, who runs her own Boston-based consultancy, cites eight "critical success factors" for E-Business. First and foremost, "you have to decide which of your customers you're targeting." (Hint: Look at which ones provide the most revenue.)

Most E-Business efforts fail because the company didn't focus on the right customers, Seybold says. Other harbingers of doom: Lack of commitment to E-Business ("It takes several years and lots of money," Seybold says) and gimmicky, poorly designed Web sites that confuse or turn off customers.

The antidote to the latter is designing your E-Business architecture "starting from the customer end," she says.

"Customers.com" is scheduled to be in bookstores Nov. 2. You can find more information about the book at www.psgroup.com.

SECOND ROUND FOR FIRSTSENSE Just four months after its initial round of funding, applications performance management software start-up **FirstSense Software, Inc.** has landed $7 million in financing from several venture capital firms.

Initial investors **North Bridge Venture Partners, Matrix Partners** and **Atlas Venture** — which collectively kicked in $4.5 million in February — were joined in the latest round by **TL Ventures.**

FirstSense, which was founded last year, also has added **Tivoli** and **Dazel Corp.** founder **Robert Fabbio** to its board of directors.

In May, the Burlington, Mass., company launched its debut product, FirstSense Enterprise, software that monitors the performance and availability of applications running on intranets, extranets and client/server networks.

$7 MILLION FOR US, $7 MILLION FOR YOU Directory management software vendor **Entevo Corp.** of Arlington, Va., has secured $7.2 million in venture funding from a variety of well-heeled sources.

In addition to first-round participants **Novak Biddle Venture Partners** and **Draper International, New Enterprise Associates, Oak Investment Partners** and **FBR Technology Venture Partners** kicked in the second-round cash.

Founded in 1993, Entevo this month released DirectManage, software that uses Microsoft's Active Directory Services Interface to help customers build flexible, directory-based systems for managing enterprise NT networks.

The company raised $2.5 million in its first venture capital round last July.

'Net Buzz needs some fireworks for the Fourth of July. So help us celebrate the holiday with a bang by sending us some blockbuster Internet- and intranet-related news, gossip and titillating arcana. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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